PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, January 16th, 1919, at 8 p.m., Sir WILLIAM J. POPE, K.B.E., F.R.S., President, in the Chair.

It was announced that the Society had lost, through death, the following Fellows:

Died on Service.

	Elected.	Died.
Charles William Dick	Feb. 15th, 1917	Nov. 9th, 1918

John Ernest Dunstan	Feb. 15th, 1917	Dec. 7th, 1918
William Lamond Howie	Jan. 20th, 1876	Dec. 17th, 1918
Hassum Alidina Lakhani	June 17th, 1909	July 19th, 1918
Thomas Stratford Logan	Dec. 4th, 1902	Oct. 31st, 1918
George Cannon McMurtry	April 4th, 1889	Sept. 29th, 1918
George Frederick Tyler Phillips ...	Dec. 1st, 1904	Oct. 14th, 1918
William Ping	Dec. 5th, 1889	Dec. 30th, 1918
Richard Spencer	March 4th, 1886	Oct. 27th, 1918
James Carter Spensley	Dec. 6th, 1917	Dec. 16th, 1918

Messrs. D. Ridge, B. Jeffs, J. W. R. Youll, W. H. Tomlinson, and W. D. Haigh were formally admitted as Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

Walter Richard Berry, B.Sc., 128, High Street, Chorlton-on-Medlock, Manchester.
Harry Blackman, 25, Walden Street, New Road, E.1.
Philip Blackman, 33A, Princess May Road, Stoke Newington, N.16.
Harold Samuel Bolton, 33, Schubert Road, East Putney, S.W.15.
Alan Charnley Burns, B.Sc.Tech., High Street, Whitehaven.

John Arthur Clements, The Quintas, Spital, Chesterfield.
Thomas Robert Dixon, Innisfayle, Cyprus Avenue, Bloomfield, Belfast.
Percy Edwin Evans, M.A., 86 Chesterton Road, Cambridge.
Geoffrey Isherwood Higson, M.Sc., 11, Westbourne Road, Berkdale, Southport, Lancs.
Edward Likiernik, B.Sc., University of London Club, 19, Gower Street, W.C.1.
Francis Falconer Peet, B.Sc., The Bryn, Monkham's Drive, Woodford Green, Essex.
Frank Radcliffe, M.B., B.S., 18, Rawlinson Road, Southport.
Frank Comer Savage, 44, Elfindale Road, Herne Hill, S.E.24
Ernest Shepherd, B.Sc., Tollington School, Muswell Hill, N.10.
Arthur John Griffiths Smout, 41, Hazelhurst Road, King's Heath, Birmingham.
Rupert Harry Truelove, B.Sc., 65, Hampton Road, Forest Gate, E.7.
Frederick Wilson Walker, 89, High Street, Welling Kent.
Walter Henry Watson, B.Sc., 19, Lightcliffe Road, Palmers Green, N.13.

It was announced that on and after January 1st, 1919, the hours of opening the Library will be as follows: Mondays, Wednesdays, and Thursdays, from 10 a.m. to 6 p.m.; Tuesdays and Fridays, from 10 a.m. to 9 p.m.; Saturdays, from 10 a.m. to 5 p.m.; and in the evenings of those days on which the Chemical Society meets.

These extended hours of opening have been arranged in connexion with the scheme in which a number of kindred societies have joined for the enlargement and increased utility of the Library.

NOTICE re DINNER AND ANNUAL GENERAL MEETING.

The attention of Fellows is directed to the decision of the Council to hold the Anniversary Dinner of the Society on Thursday, March 27th, 6.45 for 7 p.m., at the Connaught Rooms. The Informal Meeting arranged to be held at 8 o'clock that evening has therefore been cancelled, and the Annual General Meeting will take place at 4 p.m. instead of 4.30, as previously announced.

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CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY MEETING ON THURSDAY, FEBRUARY 20TH, 1919.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

BEGHIN, PIERRE, 86, Market Street, St. Andrews. Chemist. Belgian subject. Educated at the University of Ghent, taking the science course and specialising in chemistry. The "Candidate Examination" had been completed and research work commenced in preparation for the doctorate when the outbreak of war brought this work to an end. After military service with the Belgian Army I was discharged after being wounded, and, proceeding to this country, obtained a post as chemist to Messrs. Stafford Allen and Sons. Later I undertook the chief chemical control of an acid plant in Russia, but this was terminated by the Revolution. On returning to this country, I was appointed a research chemist under the Wilton Research Laboratories, and am now engaged with the investigation of dyes in the University of St. Andrews. (*Signed by*) J. C. Irvine, W. N. Haworth, G. Robertson, John Anderson, *Alex. McKenzie, John K. Wood.*

BERRY, WALTER RICHARD, 128, High Street, C.-on-M., Manchester. Research Student. Three years member of High Explosives Staff, Mancs. B.Sc. (war degree). At present revising after service in H.M. Forces, prior to research work. (*Signed by*) Harold B. Dixon, Arthur Lapworth, Colin Campbell, W. K. Slater, Henry Stephen.

BICKMORE, REGINALD CHRISTOPHER, 5, Clarence Road, Sydenham Road, N., Croydon. Chemist, Croydon Gas Company. Training :—Croydon Secondary School and Central Polytechnic (six years); studied chemistry and physics under Mr. W. H. Bentley, M.A. (Oxon.), F.C.S., and Mr. W. E. C. Jalland, M.Sc. (Manc.), to inter-science standard, during which time I passed the following examinations :—Oxford Locals and London Matriculation (1913 and 1914); further training in advanced analysis and theoretical chemistry under Mr. W. H. Bentley, up to standard of higher chemistry syllabus in Intermediate Civil Service Examinations; in chemistry, physics, mathematics, and mechanics I obtained private tuition by University graduates (September, 1916–July, 1918); from September, 1918, I have been taking science courses at the South-Western Polytechnic Institute, Chelsea. Reason for desiring admission :—I wish, through the Chemical Society, to be in closer touch with recent developments in chemistry. (*Signed by*) Geo. W. G. Tatam, Fredk. G. W. Knapman, Conrad H. Rogers, N. K. Smith, *W. Briggs.*

BLACKMAN, HARRY, 25, Walden Street, New Road, E.1. Works Chemist. I hold the Higher Certificate of the City and Guilds Technical College, Finsbury. From 1915–1916 (18 months) was director and chemist to the Durham Wharf Chemical Works, Ltd., The Mall, Hammersmith, where the manufacture of pure medicinal beta-naphthol was carried out. The process employed was discovered by myself whilst working at Finsbury Technical

College, after which the above company was floated. At present, chemist employed by the Barking Chemicals Co., Ltd., Creeksmouth, Barking, where I am engaged in the manufacture of coal-tar dyes and intermediate products. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, William H. Prince, Harry Singer.

BLACKMAN, PHILIP, 33A, Princess May Road, Stoke Newington, N.16. Schoolmaster (L.C.C. Education Dept.). I have carried out a good deal of independent original research, and the results of my investigations have been published in the Chemical Society's Journal, *Chemical News*, *Philosophical Magazine*, *Journal of Physical Chemistry*, *Berichte*, *Zeitschrift für Physikalische Chemie*, *Chemiker Zeitung*. Two of my methods for determining vapour densities and one for determining molecular weights have been adopted in practice, and descriptions of them have begun to appear in chemical works (*e.g.*, Findlay's "Practical Physical Chemistry," third edition (Longmans and Co.), pp. 60–67; Sudborough and James's "Practical Organic Chemistry" (Blackie and Son), pp. 86–87. (*Signed by*) John M. Thomson, S. W. Collins, Patrick H. Kirkaldy, Herbert Jackson, L. E. Hinkel, *Henry L. Smith*.

BOLTON, HAROLD SAMUEL (Lieutenant, R.E.), 33, Schubert Road, East Putney, S.W.15. Technical Chemist. Studied chemistry and dyeing for four years at Bradford Technical College; five years' works experience; recently assistant research chemist under Chemical Warfare Dept., Ministry of Munitions. (*Signed by*) Thomas H. Durrans, Eustace E. Turner, J. Krizewsky, C. S. Gibson, Walter M. Gardner, Barker North.

BOWREY, STANLEY EDWARD, Westwood, 115, Hainault Road, Leytonstone, E.11. Works Chemist. Eight years chief chemist with Messrs. Alex. Duckham and Co., oil and lubricant manufacturers, London; two years assistant chemist with Messrs. J. Knight, Ltd., soap makers; two years pupil with Mr. Leo Taylor, F.I.C., F.C.S., Borough Analyst, Hackney; Bachelor of Science (London). (*Signed by*) A. E. Dunstan, Alex. Duckham, F. B. Thole, H. M. Langton, F. Henry Streatfeild, *J. N. Collie*, *S. Smiles*.

BROWN, SOLOMON NATHAN, 30, St. James' Road, Hr. Broughton, Manchester. Technical Chemist. I have had three years' day training in pure and applied chemistry at the Royal Technical Institute, Salford, gaining Final Diploma, also diplomas (ordinary grade and honours), City and Guilds London Institute, in dyeing, bleaching, and finishing; Board of Education, higher organic chemistry; have had two years' experience in organic research, Clayton Aniline Co., Manchester; also four months' analytical experience at Trafford Park Chemical Works, Manchester. I have done also some unpublished research work on dinitrotoluene, and ψ-amidophenol-*p*-sulphonic acid. (*Signed by*) B. Prentice, E. Clark, J. R. Appleyard, *V. Edge*, *E. Knecht*.

BRYANT, JOHN JOSEPH, 28, Greenwood Road, Dalston, E.8. Works Chemist. Studied chemistry and physics at City of London College, 1892 to 1899, and have taken many shorter courses since on various subjects; assistant to W. A. H. Naylor, Esq., F.I.C., for nine years, during which time I assisted him in all his research work; and was then assistant for some little time to C. A. Hill, Esq., F.I.C.; I have since held posts chiefly as works chemist, and for the past eight years have been chemist to Messrs. T. F. Bristow and Co., soap makers and perfumers, Clerkenwell, E.C. I am interested in research, and wish for the Journal to keep myself well posted. My last publication was on "Synthetics used in Perfumery," *Ph. J.*, February, 1914. (*Signed by*) W. A. H. Naylor, C. A. Hill, Ernest J. Parry, E. J. Millard, Francis Ransom, T. H. W. Idris, *Samuel Rideal*, *E. W. Lucas*.

BURNS, ALAN CHARNLEY, High Street, Whitehaven. B.Sc., Faculty of Technology, University of Manchester. Lieut. R.E. (Special Brigade), late Signalling and Intelligence Officer, 2nd Bn. the Royal Scots. Intention—to prepare for M.Sc. (Tech.), organic research, on discharge from hospital. Member of Society of Chemical Industry. (*Signed by*) Edmund Knecht, F. S. Sinnatt, C. Polychronis, Jas. Grant, *Leon E. Vlies*, *R. L. Taylor*.

BUTTERWORTH, GEORGE, 107, Burlington Street, Ashton-u.-Lyne. Analytical Chemist and Metallurgist to the National Gas Engine Co., Ltd. Trained at the Royal College of Science and Royal School of Mines, London, 1888–90, in chemistry, physics, and metallurgy under Professors Thorpe, Rücker, and Roberts-Austen; for fifteen years senior science master in the Ashton-u.-Lyne Secondary School in chemistry and physics, and for ten years previously science master in the Ashton-u.-Lyne Organised Science School. (*Signed by*) A. E. H. Tutton, William French, John Horsfall, Frank Brinsley, Wilfred Mather.

CABELL, HAROLD FRANK, 66, Annan Road, Gretna, N.B. Chemist, H.M. Factory, Gretna. B.Sc. (Lond.), A.I.C. Chemist in charge of shift of about 300 mixed operatives in manufacture of cordite for past 2½ years. (Released from active service by Ministry of Munitions.) (*Signed by*) David Hooper, J. C. Burnham, J. W. Porter, *J. R. H. Bartlett*, *Douglas Bowack*, *J. C. Spensley*.

CHEAVIN, WILLIAM HAROLD SQUIER, 70, Somerset Road, Huddersfield, and Middlesex Hospital Medical School, Berners Street, London, W. Lieut., R.E. Gas Services, Middlesex Regt., and assistant lecturer and demonstrator, chemistry, physics, Medical School, Middlesex Hospital, London, W.1; formerly demonstrator in chemistry, Huddersfield Technical College, 1900–1905: Fellow of the Royal Microscopical Society and Fellow of the Entomological Society, London; honours student, Board of Education, in chemistry, organic and inorganic; extension lecturer to the Selborne Society, London; lecturer, the National Union of Teachers, London. Inventor, Cheavin Watson microscope, 1910. Founder of the photomicrography of postage stamps (*i.e.*, forgery detection). Contributor of original articles and papers to journals—Royal Philatelic Society, Royal Microscopic Society, Photomicrographic Society, etc., etc. *Knowledge and Scientific News*, *British Journal of Photography*, *Photographic Scraps*, *Marvels of Insect Life*, *Scientific Monthly*, etc., etc. Student of chemistry, the University of Leeds, 1905–1908; Huddersfield Technical College, 1898–1905, 1910–1912. Desirous of receiving admission to further research in chemistry as relating to micrology, biology, etc., by receipt of the *Journal of the Chemical Society*. (*Signed by*) A. M. Kellas, H. M. Dawson, James Bruce, Lewis S. Cocking, J. B. Cohen.

CLEMENTS, JOHN ARTHUR, The Quintas, Spital, Chesterfield. Technical and Analytical Chemist. 1911–1915, chief chemist to the Sheepbridge Coal and Iron Co., Ltd., Chesterfield; 1915–1916, chief chemist to the Staveley Coal and Iron Co., Ltd., Chesterfield; 1916–1918, technical chemist, Dept. of Explosives Supply, Ministry of Munitions; served at H.M. Factory, Oldbury, H.M. Factory, Queensferry, and H.M. Factory, Pembrey; 1907–1911, trained at the University of Sheffield, under Prof. J. O. Arnold, D.Met., Associate in Metallurgy of that institution, together with extensive chemical training; Associate of the Institute of Chemistry. (*Signed by*) W. R. Moore, H. Mansfield, E. J. Amies, L. T. O'Shea, T. Eynon Davies.

CULL, EDWARD CHARLES, (permanent) 31, Bourne Street, Dudley. Until entering H.M. Navy as a schoolmaster, I was head of the science and mathematics department, The Training College, Dudley. 1907, London B.Sc.; 1908,

London Teachers' Diploma; 1910–1913, assistant to the Professors of Education and Mathematics, University College, Exeter; 1913–1916, head of science and mathematics department, The Training College, Dudley; since 1916 have been stationed, for naval duties, in Devonport, and have been engaged, both last winter and this, as lecturer in elementary and advanced inorganic chemistry at the Technical School, Plymouth, in the evening classes. (*Signed by*) W. H. Lewis, F. Southerden, James R. Thackrah, D. R. Boyd, A. E. H. Tutton.

DANI, VISHWANATH GANESH, 25, Carlingford Road, Hampstead, N.W.3. Student. B.A. (Cambridge), with chemistry as one of the subjects; intend doing chemistry teaching on return to India. (*Signed by*) B. B. Dhavale, W. J. Pope, W. H. Mills, *Burrows Moore*, *C. S. Gibson*.

DIXON, THOMAS ROBERT, Innisfayle, Cyprus Avenue, Bloomfield, Belfast. Distillery and Maltings Manager. For last twenty years in charge of laboratories as practical malting, brewing, and distillery analytical chemist; have during the whole of this period been closely engaged in analytical and research work in connexion with the industries where employed; am the author of two papers given to the Institute of Brewing (Scottish Section), dealing with the bearing of science on the practice of malting; Diploma Member of Institute of Brewing. (*Signed by*) John Doull, John S. Ford, G. H. Gemmell, *H. W. Harman*, *Lawrence Briant*.

EARL, JOHN CAMPBELL, 161, South Street, St. Andrews. Chemist. Undertook a complete course (four years) at Finsbury Technical College, specialising in organic chemistry; thereafter devoted two years at the Imperial Institute to the examination of plant products: after spending some time in Australia at the manufacture of essential oils, I accepted and held for two years a post as chemist under Dr. Hargreaves; at present I am engaged as a research chemist under the Wilton Research Laboratories, my work being conducted in the University of St. Andrews. (*Signed by*) J. C. Irvine, W. N. Haworth, G. Robertson, John Anderson, *Alex. McKenzie*, *John K. Wood*.

EVANS, PERCY EDWIN, St. Medards, 86, Chesterton Road, Cambridge. Technical Assistant, Ministry of Munitions. M.A. Cambridge, Natural Science Tripos, Parts I. and II.; joint papers in *J.C.S.*, 1911, T. 334, *J.C.S.*, 1912, T. 1,389; lecturer in science, Royal College, Colombo (1914–1918); A.I.C. (*Signed by*) T. Martin Lowry, A. F. Joseph, E. de W. S. Colver, H. A. Wootton, K. C. Browning.

FARMBROUGH, ALFRED, 259, Lewisham High Road, S.E.4. Assistant Chemist, India Office, Stores Dept. Four years as student at Technical College, Finsbury; awarded College certificate in 1909; five years as second assistant chemist, India Office; four years acting chief assistant chemist, India Office. (*Signed by*) H. J. Evans, Eustace E. Turner, H. Shulman, *Samuel Smiles*, *Henry Terrey*.

GRANGER, JAMES DARNELL, c/o The Chiswick Polish Co. of Australia, Ltd., Mitchell Road, Alexandria, Nr. Sydney, N.W. Manager and Chemist. Ph.D. (*magna cum laude*), Berlin, 1896; F.I.C., 1897; chemist to the Chiswick Soap Co., London, W. (the title of which was later altered to the Chiswick Polish Co.), 1897; manager and chemist of the Chiswick Polish Co. of Australia, Ltd., Sydney, N.S.W., 1912. (*Signed by*) Richard W. Challinor, Henry G. Smith, Frank A. Coombs, S. E. Sibley, C. E. Fawsitt, Loxley Meggitt.

HANCOCK, ALGIE, 3, North Street, St. Andrews, Fifeshire, Scotland. Research Chemist. After three years' experience in dyeing, completed the A.I.C. course in chemistry at University College, Nottingham, under Professor

Kipping; thereafter acted as analytical and research chemist for two years with a firm of chemical merchants; at present am engaged in the University of St. Andrews as a research chemist with the Wilton Research Laboratories. (*Signed by*) J. C. Irvine, W. N. Haworth, G. Robertson, John Anderson, *Alex. McKenzie, John K. Wood.*

HARDWICK, WALTER ARTHUR NELSON, 26, West Kensington Mansions, London, W.14. Organic Chemist. Associate of Royal College of Science in Chemistry; two years' experience in organic chemical research in connexion with manufacture of dyes and intermediates; two years' analytical and works experience in petroleum industry. (*Signed by*) James C. Philip, A. T. King, H. F. Harwood, *P. W. Robertson, Arthur A. Eldridge.*

HEASMAN, BENJAMIN RICHARD, "Rutherglen," Throwley Road, Sutton, Surrey. Research Chemist, Royal Arsenal, Woolwich, S.E.18. Graduated B.Sc., London, 1914; A.I.C., 1918. (*Signed by*) Oscar L. Brady, A. Forster, Percy N. Williams, H. Swann, Arthur Fairbourne.

HEAVEN, GEORGE SAMUEL, Templemead, Albany Road, Coventry, Research Chemist, Courtaulds, Ltd., London. B.Sc. (Lond..), F.I.C.; science master in schools at Cheltenham, Coventry, till 1914; chemist at National Filling Factory and Messrs. White and Poppe, Ltd., Coventry, till 1918; research chemist, Messrs. Courtaulds, Ltd., from 1918. (*Signed by*) Sidney S. Napper, Harold J. Page, A. Chaston Chapman, F. F. Renwick, *T. M. Lowry.*

RINTOUL-HIGHAM, JAMES, "Ivermore," Richmond Road, E. Twickenham. Student of Chemistry in the Laboratory of W. H. Simmons, Esq., B.Sc., F.C.S., F.I.C., 96, Victoria Street, S.W. Student of agricultural science, University, Cape of Good Hope; student of medicine at Jesus College, University of Cambridge; Cambs. Prelim. Science and 1st M.B. (*Signed by*) Gilbert J. Alderton, W. H. Simmons, G. Nevill Huntly, Edward L. Joseph, *E. Richards Bolton.*

HIGSON, GEOFFREY ISHERWOOD, 11, Westbourne Road, Berkdale, Southport, Lancs. Research Chemist. M.Sc. (Liverpool), A.I.C.; research at Liverpool and Hanover; research chemist to the British Photographic Research Association. (*Signed by*) R. E. Slade, Samuel Smiles, W. B. Tuck, Eric K. Rideal, *Irvine Masson.*

HODKIN, FREDERICK WILLIAM, 28, Thoresby Road, Hillsbro', Sheffield. Analytical Chemist. B.Sc. (Sheffield), A.I.C.; two years master at the Minster Grammar School, Southwell, Notts.; assistant analyst, Admiralty Inspection Offices, Sheffield, August, 1915–January, 1916; senior assistant analyst in charge of Admiralty Laboratory, Glasgow University, January 1916, to date. (*Signed by*) Cecil H. Desch, T. S. Patterson, A. W. Stewart, James Roberts, Douglas A. MacCallum.

JEPHCOTT, HARRY, 43, King Henry's Road, Hampstead, N.W.3. Analytical Chemist, Government Laboratory. M.Sc. (London), A.I.C. (Food and Drugs). B.Sc. (Lond.), with first-class honours in chemistry; Major Diploma, Pharmaceutical Society; silver medallist in pharmacology. (*Signed by*) James J. Dobbie, J. Woodward, George Dean, Geo. Stubbs, Geo. N. Grinling.

JOB, ANDRÉ, Paris, 18, Avenue d'Orléans (XIV.e Arrondisst.). Professeur de Chimie Générale au Conservatoire National des Arts et Métiers, Paris. Récherchés sur les mécanismes d'oxydation et sur la catalyse oxydante. (Thèse de doctorat, Paris, 1899. Publications aux Comptes Rendus de l'Académie des Sciences). Fonctions universitaires: de 1899 à 1903, maître de conférences à l'Université de Rennes; de 1903 à 1908, Professeur de Chimie à l'Université de Toulouse; depuis 1908, Professeur au Conservatoire National des Arts de Métiers. (*Signed by*) Alexander Scott, Arthur W. Crossley,

V. Lefebure, Jocelyn Thorpe, C. R. Young, W. J. Pope, H. S. Raper, H. Hartley.

JOHNSTON, RICHARD EDWARD, "Overhill," 504, Lordship Lane, Dulwich, S.E.22. Works Chemist, Western Electric Co., Ltd. (telephone and cable manufacturers). Studied theoretical and practical chemistry and metallurgy at the Woolwich Polytechnic; also mineralogy at Goldsmiths' College. I am desirous of keeping in touch with the latest chemical investigations. (*Signed by*) Francis Martin, Alex. F. Hogg, G. H. Martin, Godfrey Melland, H. Rogers.

LIKIERNIK, EDWARD, University of London Club, 19, Gower Street, W.C.1. Chemist. London B.Sc. (honours in chemistry, 1901); from 1907 to 1915, Continental manager to Messrs. Ernest Scott and Co., Ltd., Kingsway House, W.C.2, chemical engineers; from 1915 to the present, department manager to the Chemical Supply Co., Old Gas Works, Barking, E., chemical manufacturers. (*Signed by*) Edgar Neumann, Herbert E. Burgess, Percy C. C. Isherwood, Thomas D. Morson, Geoffrey Martin.

MOONEY, FRANCIS FREDK., 39, Queen's Place, Summerseat, Nr. Manchester. Chemist to the Rochdale Road Gas Works, Manchester Corporation. Educated at the Royal Institute of Technology, Salford, for three years in the daytime courses; obtained from the aforementioned Institute a "Senior Course Diploma" in chemistry and applied sciences, endorsed by the Board of Education; engaged as assistant chemist to Messrs. Hardman and Holden, coal-tar distillers, Manchester, for two years; at present engaged as chemist to the Rochdale Road Gas Works, Manchester Corporation. In February, 1917, I read a paper before the Manchester and District Junior Gas Association on "Coal Tar Analysis," which appeared in the technical Press. I have now been at Rochdale Road Gas Works for three years. (*Signed by*) John Turnbull, James Booth, Evan Williams, *Herbert H. H. Lorenz, John Hugh Jeffery.*

MORRIS, SYDNEY WALTER, 46, Braithwaite Road, Sparkbrook, Birmingham. Manager and Works Chemist. Formerly at Messrs. Phillip Harris and Co., Ltd., Birmingham; for nine years chemist to Messrs. Llewellyn Ryland, Ltd., Birmingham, varnish and paint manufacturers. Desire to keep in touch with modern developments of chemistry. (*Signed by*) Edgar Neumann, S. H. Green, Herbert E. Burgess, *Thomas D. Morson, H. J. H. Fenton.*

MOUREU, CHARLES, 18, Rue Pierre Curie, Paris. Professor of Chemistry. Membre de l'Institut et de l'Académie de Médicine; Professeur au Collège de France; Directeur de la Revue Scientifique. (*Signed by*) W. J. Pope, M. O. Forster, Arthur W. Crossley, Alexander Scott, *Henry E. Armstrong.*

NASH, WILLIAM ADRIAN THOMAS, 1, St. Barnabas Villas, Guildford Road, London, S.W.8. H.M. Forces (Lieut. R.E.). Matriculation, London University, 1911; Intermediate B.Sc., London University, 1912; student, Royal College of Science, London, 1914–1916; 1st class Associateship of Royal College of Science, 1916; H.M. Forces (Water Supplies), 1916 to present date. (*Signed by*) H. F. Harwood, Arthur A. Eldridge, A. T. King, James C. Philip, *P. W. Robertson.*

PARRISH, JOHN, Ringwood, The Green, Sidcup, Kent. Technical Chemist. (*a*) Bachelor of Technical Science (Manchester), Honours Division; (*b*) Associate of the Institute of Chemistry; (*c*) for three years chief chemist on the Government calcium nitrate plant at the works of the Ammonia Soda Co., Ltd., Lostock Gralam, Cheshire; (*d*) at present attached to the Technical Staff of the Ministry of Munitions, Explosives Department, Westminster,

(*Signed by*) E. Knecht, F. S. Sinnatt, S. J. Peachey, E. L. Rhead, *U. Polychronis.*

PEET, FRANCIS FALCONER, B.Sc. (Lond.), The Bryn, Monkham's Drive, Woodford Green, Essex. Chemistry Master. Science master for twelve years at Steyning Grammar School, Kettering Grammar School, and now at Bancroft's School, Woodford Green; two years factory chemist with Nobel's Explosives Co., Ardeer and Irvine. (*Signed by*) B. S. Mellor, Edward Wheeler, Norman Picton, T. W. Price, Wm. Barbour, *R. A. Joyner.*

PENDLEBURY, ERNEST ED., "Moss Bank," 184, Wellington Road, Eccles, Nr. Manchester. Analytical Chemist. Three years' diploma course in chemistry, etc. (1912–15, Salford Royal Technical Institute); one year advanced analysis (1916–17, Manchester College of Technology); 6½ years assistant chemist, Messrs. J. and J. M. Worrall, Ltd., dyers, etc., Salford, Manchester; two years senior assistant to chief chemist, Analytical Laboratory, Messrs. Clayton Aniline Co., Ltd., Manchester; six months analytical and works chemist, Messrs. Holt, Thompson and Co., Ltd., fine chemical manufacturers, Liverpool; four months analytical and works chemist, Trafford Park Chemical Works, Manchester; at present analytical and research chemist, John W. Leitch and Co., Milnsbridge, Huddersfield. (*Signed by*) S. J. Peachey, Jas. Grant, J. R. Appleyard, B. Prentice, E. Clark.

RADCLIFFE, FRANK, 18, Rawlinson Road, Southport. Physician. Bachelor of Medicine and Bachelor of Surgery (Edin.); Fellow of the Royal Society of Medicine (Lond.); Prizeman in chemistry and attended several courses in the subject before and since qualifying as physician. (*Signed by*) Jas. Grant, S. J. Peachey, R. L. Taylor, C. Polychronis, Burrows Moore.

RAMSDEN, JOSSLYN VERE, c/o Cox and Co., 16, Charing Cross, S.W. Lieutenant-Colonel, Royal Artillery. Assistant Controller, Department of Gun Ammunition Filling, Ministry of Munitions. Interested in chemical research. (*Signed by*) T. Martin Lowry, A. F. Joseph, K. C. Browning, W. J. Pope, C. S. Gibson.

RILEY, ALBERT, Westfield Lodge, Thorner, near Leeds. Research Chemist. B.Sc., Hons. Chem., Vict., 1914; A.I.C.; research chemist for British Dyes, Ltd., at Leeds University. (*Signed by*) Harold B. Dixon, Arthur Lapworth, F. P. Burt, J. E. Myers, Colin Campbell, W. K. Slater.

SAMUEL, THOMAS JOHN, Travellers' Well, Pwll, Llanelly, Carm. Explosives Chemist. Student, Swansea Technical College, 1909; Hartley University College, Southampton, 1909–11; Cardiff Technical College, 1912; studied physics, chemistry, mathematics, pure and applied; certificates: London Intermediate Science, Diploma of Institute of Hygiene, Diploma of Royal Horticultural Society; advance certificates in physics and chemistry, Board of Education; teacher: taught chemistry, physics, hygiene, at Llanfabon Schools, Glam., 1912–1915; chemical manufacture: plant chemist, H.M. Factory, Pembrey; T.N.T. Department, 1915–1918; during 1918 assistant superintendent of T.N.T. Department. (*Signed by*) Edgar Lewis, R. J. Hughes, A. J. Leigh, T. Eynon Davies, Edwin J. Amies.

SAVAGE, FRANK COMER, 44, Elfindale Road, Herne Hill, S.E. Chemist in the chemical laboratories of Messrs. Menley and James, Ltd., manufacturing chemists, London, E.C. Pupil for four years of the late John Barclay, B.Sc., F.I.C., analytical chemist, lecturer in the University of Birmingham, and for three years assistant to him; pupil for three years of R. A. Cripps, F.I.C., F.C.S., Public Analyst of Brighton; for ten years chief chemist in the laboratories of Reynolds and Branson, Ltd., manufacturing chemists, Leeds;

28 years' experience of practical analytical and manufacturing chemistry. I desire to keep in constant touch with scientific chemical progress, to attend the meetings, and receive the publications of the Society. (*Signed by*) F. W. Crossley-Holland, Archibald Macpherson, F. W. Branson, *Percy Barrs*, *J. Wicliffe Peck*.

SHEPHERD, ERNEST, Tollington School, Muswell Hill, N.10. Senior Science Master. (i.) London University, B.Sc., student at Birkbeck College; (ii.) Licentiate, College of Preceptors, 1st in Honours and Prizeman in chemistry; (iii.) engaged in teaching science, 1904 to present date. Preparing for Institute of Chemistry examination, and in view of such, together with a desire to follow closely the interests of science, I wish to become proficient with up-to-date chemical knowledge. (*Signed by*) George Senter, Fred. Barrow, H. D. H. Drew, Alex. McKenzie, *Geoffrey Martin*, *L. E. Hinkel*.

SMOUT, ARTHUR JOHN GRIFFITHS, 41, Hazelhurst Road, King's Heath, Birmingham. Analytical Chemist. Associate Institute of Chemistry; Associate Institution of Mining and Metallurgy; early training in chemistry under Dr. Baker; five-year course in chemistry under Dr. Price and Dr. Twiss at Birmingham Technical School (recognised by Institute of Chemistry); afterwards specialised in metallurgical chemistry, took 3rd year course in metallurgy, University of Birmingham, and obtained King's Prize in assaying and 1st class Honours metallurgy (Board of Education), together with bronze medal for proficiency in science; 1915–1918, chemist, Elliott's Metal Co., Ltd., "C" Works, where I have had much experience in all branches of metallurgical chemistry, and have been engaged in many researches connected with the application of chemical science to metallurgy; ex-C.S.M., Birmingham University O.T.C. (Senior Division), discharged 1915 for "important munition work." Desire Fellowship for the use of Journal and Library as a great help in keeping in touch with pure chemistry, and in my general analytical and chemical work. (*Signed by*) Arthur Forshaw, H. James Yates, T. J. Baker, D. F. Twiss, R. J. Redding.

STERNE, EDWARD TYGHE, Trenton, Ontario, Canada. Chief Chemist, British Chemical Co. Two years lecturer in industrial chemistry, Queen's University; two years research assistant to Dr. L. F. Goodwin, late technical adviser to the War Office; research on the manufacture of acetone from calcium acetate; published an article on the possible recovery of toluene from water gas; one year technical representative of the Imperial Munitions Board at the national plant for the manufacture of trinitrotoluene and nitrocellulose powder; at present chief chemist and member of Advisory Technical Board at the national plant, Trenton, Canada. (*Signed by*) L. F. Goodwin, J. L. McKee, George H. Bostock, *W. R. Lang*, *Alfred E. Macintyre*, *Harold J. Roast*.

THOMPSON, HUGH VERNON, Croft House, Garden Village, Stoke-on-Trent. Head of Chemical Department, Central School of Science and Technology, Stoke-on-Trent. M.A., Cambridge; late scholar, Trinity College, Cambridge; Gordon Wigan Research Prize (Cambridge University). (*Signed by*) J. W. Mellor, A. J. Berry, W. H. Mills, C. T. Heycock, C. S. Gibson.

TRUELOVE, RUPERT HARRY, 65, Hampton Road, Forest Gate, E., Works Chemist. Fellow of the Institute of Chemistry; Associate of the Royal College of Science; B.Sc., London University, 1st Class Honours in chemistry; six years' experience of analytical and manufacturing chemistry; now chemist to the Red Hand Compositions, Ltd., Silvertown, manufacturers of ships' bottoms compositions and paints. (*Signed by*) James C. Philip, Arthur J.

Ewins, M. O. Forster, C. E. Cooke, George W. Dunster, W. G. Aston, F. H. Streatfeild.

WALKER, FREDERICK WILSON, 89, High Street, Welling, Kent. Research Chemist. One year research chemist, Skinningrove Iron Co., Ltd.; two years research chemist, Research Department, Royal Arsenal, Woolwich; Associate of the Royal College of Science; Associate of the Institute of Chemistry. (*Signed by*) R. Robertson, W. H. Gibson, S. Sugden, Oscar L. Brady, Arthur Moore.

WARNEFORD, FRANCIS HENRY SWEETING, 21, Rochester Avenue, Sedgley Park, Prestwich, Manchester. Chemist, Levinsteins, Ltd. B.Sc. (McGill) (Honours chemistry); B.A. (Cantab.) (research); A.I.C. (*Signed by*) C. S. Gibson, E. E. Turner, W. H. Mills, W. J. Pope, Arthur G. Green, Horace F. Oxley.

WATSON, WALTER HENRY (B.Sc., Lond., A.R.C.S.), 19, Lightcliffe Road, Palmers Green, London, N.13. Lecturer on Chemistry. Head of chemical dept., Portsmouth Municipal College; formerly acting head (1915–1918) of chemical dept., Northern Polytechnic Institute, London; joint author of papers (with Prof. H. B. Baker and with Dr. W. H. Mills) published in the *Journal of the Chemical Society*. (*Signed by*) H. B. Baker, John Spiller, James C. Philip, W. H. Mills, Charles A. Keane.

WILLIAMS, LEO DAFT, 16, Hauteville Court, Stamford Brook, W.6. Chemical Engineer. Studied at City and Guilds Technical College, Finsbury, and obtained the certificate; two years in a chemical works and co-inventor of a fire-damp detector. (*Signed by*) G. T. Morgan, W. H. Prince, A. J. Hale, William R. Grist, Harry Singer.

WOODS, GREATREX JOHNSON, 52, Burrard Road, West Hampstead, N.W.6. At present Supply and Technical Officer (Captain), Royal Air Force; previously analytical and manufacturing chemist. For five years assistant to J. A. Pond, Esq., F.C.S., Government Analyst at Auckland, N.Z.; for nine years (ending April, 1917) chief analyst at works of Messrs. Burroughs Wellcome and Co., Sydney, N.S.W.; whilst with this firm also had charge of pharmaceutical, manufacturing, and animal products departments; pharmaceutical chemist, registered in New Zealand. (*Signed by*) S. B. Schryver, Joseph C. Kernot, L. R. B. Pearce, *J. C. Cain, Hubert L. Lucking.*

WOOSNAM, CHARLES THOMAS, 22, Royal Avenue, Lowestoft. Teacher of Chemistry, Municipal Secondary and Technical Schools, Lowestoft. M.A. (Cantab.), Downing College (Natural Sciences Tripos); ten years' experience in teaching chemistry at the Municipal Secondary and Technical Schools, Lowestoft (1909–1919); at present I am (by request) determining the calorific value of the coal supplied to various local engineering firms; also I have commenced the analysis of the drinking water (from wells) supplied to the cottages in the surrounding district. (*Signed by*) A. J. Berry, H. J. H. Fenton, Charles T. Heycock, *J. W. H. Oldham, C. S. Gibson.*

The following Certificate has been authorised by the Council for presentation to ballot under Bye-law I (3):—

O'DOWD, PARNELL STANLEY, 43/2, Canal East Road, Calcutta. Manager, The Indian Oil Products Co. Position requires knowledge of recent literature on oil cakes and products. (*Signed by*) A. C. Sircar, J. N. Rakshit, *P. C. Ray, B. B. Dey, J. Bhaduri.*

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, February 6th, 1919, at 8 p.m., Dr. ALEXANDER SCOTT, M.A., F.R.S., Vice-President, in the Chair.

It was announced that the Society had lost, through death, the following Fellows:

	Elected.	*Died.*
Norman Scott Rudolf	May 6th, 1909.	Jan. 29th.
John Young	Feb. 5th, 1874.	Jan. 26th, 1918.

Certificates of Candidates were read for the first time in favour of:

Lionel Conrad Andrews, B.Sc., Cressingham House, Carshalton, Surrey.
Nicholas Lionel Anfilogoff, Lathol House, Thames Haven, Essex.
Edward Bloom, B.Sc., 61, Berwick Street, W.1.
William Brash, B.Sc., 53, Aynhoe Road, W. Kensington, W.14.
Isaac Cohen, 50, Redmans Road, E.1.
Swondranath Dhar, 21, Cromwell Road, S. Kensington, S.W.5.
Ralph Eddowes Garrod, M.A., 5, College Gardens, Dulwich Village, S.E.21.
Edgar Thomas Griffiths, 100, Commercial Street, Tredegar, Mon.
Thomas Owen Griffiths, B.Sc., Hazelwood, Erskine Road, Colwyn Bay.
Thomas Haigh, B.A., 15, Cavendish Avenue, Church End, Finchley, N.3.
Frederick Denison Maurice Hocking, 18, Woodside Park Road, N. Finchley, N.12.
George Hugh Hodgson, 41, Roach Road, Sheffield.
Armand Houssa, B.Sc., 11, Tremadoc Road, Clapham, S.W.4.
Henry Lawrence Long, B.Sc., 19, Seward Road, Hanwell, W.7.
William McHutchison, B.Sc., 108, City Road, Edgbaston, Birmingham.
William Angus McIntyre, B.Sc., 18, Leinster Avenue, East Sheen, S.W.14.
John Alexander McNaughton, Birkwood, Redhill, Castleford.
Samuel Mellins, 50, Great Garden Street, E.1.
Francis William Moorhouse, 57, Frodingham Road, Scunthorpe.

Kishori Lal Moudgill, B.Sc., Christ's College, Cambridge.
Hari Das Sen, M.Sc., Nawabganj, Cawnpore, India.
Edmund Joseph Sterne, Felsham, Bury St. Edmunds.
Donald Willoughby Capon West, Slinfold, Horsham, Sussex.
Alfred Sydney Vince, 30, Ravensbourne Road, Catford, S.E.6.

The following papers were read:

"The preparation of monomethylamine from chloropicrin." By P. F. Frankland, F. Challenger, and N. A. Nicholls.
"The preparation of monomethylaniline." By P. F. Frankland, F. Challenger, and N. A. Nicholls.

ANNIVERSARY DINNER.

Fellows are reminded that the Anniversary Dinner of the Society will be held at the Connaught Rooms on Thursday, March 27th, at 6.45 for 7 p.m. Tickets for Fellows and their guests, price 10*s.* 6*d.* each, can be obtained from the Assistant Secretary.

It will facilitate making arrangements if Fellows will kindly make application for tickets as early as possible.

LECTURE.

Professor J. W. Nicholson, F.R.S., will deliver his Lecture entitled "Emission spectra and atomic structure," on Thursday, March 6th, at 8 p.m.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

Eaton, Bertie James, assisted by J. Grantham and F. W. F. Day. The preparation and vulcanisation of plantation Para rubber. (Federated Malay States Dept. of Agric., Bull. No. 27.) Kuala Lumpur 1918. pp. iv+398. ill. $1. (*Recd.* 29/1/19.)
From the Department.

FRYER, PERCIVAL JOHN, and WESTON, FRANK EDWARD. Technical handbook of oils, fats, and waxes. Vol. II. Practical and analytical. Cambridge 1918. pp. xvi+314. ill. 15*s.* net. (*Recd.* 2/1/19.)

From the Publishers: The Cambridge University Press.

HENRICH, FERDINAND. Chemie und chemische Technologie radioaktiver Stoffe. Berlin 1918. pp. viii+351. (*Recd.* 21/12/18.)

From the Department of Scientific and Industrial Research.

MINISTRY OF MUNITIONS JOURNAL. 2 vols. London 1916—1918. (2 copies.) From the Editorial Committee.

SPIELMANN, PERCY EDWIN. Tables of chemical and physical constants of special interest to the light naphtha section of the coal tar and coke oven industries. Including weight-gallonage conversion tables and dip-gallonage tables for travelling tank wagons calculated by EDWARD GIDLEIGH WHEELER. London 1918. pp. 67. 4*s.* 6*d.* net. (*Recd.* 5/2/19.) From the Author.

WORDEN, EDWARD CHAUNCEY. Technology of cellulose esters. Vol. VIII. New York 1916. (Second copy.)

From the Author.

II. *By Purchase.*

CHALMERS, T. W. The production and treatment of vegetable oils, including chapters on the refining of oils, the hydrogenation of oils, the generation of hydrogen, soap making, the recovering and refining of glycerine, and the splitting of oils. London 1918. pp. xii+152. ill. 21*s.* net. (*Recd.* 12/2/19.)

FRIEDLÄNDER, P. [Editor]. Fortschritte der Teerfarbenfabrikation. Vol. 12. 1914—1916. Berlin 1917. pp. viii+1986. (*Reference.*)

GIUA, MICHELE, and GIUA-LOLLINI, CLARA. Chemical combination among metals. Translated by GILBERT WOODING ROBINSON. London 1918. pp. vii+337. ill. 21*s.* net. (*Recd.* 12/2/19.)

GUTTENTAG, WILFRED E. Petrol and petroleum spirits. A description of their sources, preparation, examination and uses. London 1918. pp. xi+135. ill. 10*s.* 6*d.* net. (*Recd.* 12/2/19.)

MAXTED, EDWARD BRADFORD. Catalytic hydrogenation and reduction. London 1919. pp. viii+104. ill. 4*s.* 6*d.* net. (*Recd.* 12/2/19.)

ULLMANN, FRITZ. Enzyklopädie der technischen Chemie. Vol. 5. Essigsäure—Gase. Berlin 1917. pp. 737. ill. (*Reference.*)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, February 20th, 1919, at 8 p.m., Sir WILLIAM POPE, K.B.E., F.R.S., President, in the Chair.

It was stated that the Society had lost, by death, the following Fellows:

	Elected.	Died.
Herbert Stoddard Coleman	Dec. 4th, 1913.	Jan. 27th.
George Carey Foster	Mar. 3rd, 1856.	Feb. 9th.
Edward Lewis James	June 20th, 1912.	Dec. 3rd, 1918.
John Falconer King	Dec. 7th, 1876.	Feb. 12th.
George Martineau	June 1st, 1871.	Feb. 5th.

Certificates were read for the first time in favour of:

Robert Parmenter Burwell, B.Sc., 92, Southtown Road, Great Yarmouth.
Charles Hall, Woodbridge School, Woodbridge.
Vernon Percy Hart, 42, Park Grove, Portway, West Ham, E.15.
Sidney John Hopkins, London House, Hambledon, Hants.
Fred Hughes, 39, Lord Street, Runcorn.
Lazarus Mendel, 25, Broadway, West Ealing, W.13.
Rames Chandra Ray, M.Sc., Moradpur P.O., Bankipore, India.
Nathan Singer, 147, Upper Clapton Road, E.5.
William Arthur Walmsley, B.Sc., 17, Elmfield Road, Davenport, Stockport.

A Certificate for Election has been authorised by the Council for presentation to ballot under Bye-law I (3) in favour of:

Professor Clarence Thomas Hamill, 606, Walnut Avenue, Syracuse, N.Y., U.S.A.

The PRESIDENT announced that the following changes in the Officers and Council were proposed by the Council:

As Vice-Presidents to Retire.—Professor G. G. Henderson and Professor A. Lapworth.

As Ordinary Members of Council to Retire.—Mr. A. Chaston Chapman, Mr. D. L. Chapman, Sir Herbert Jackson, and Dr. F. L. Pyman.

As President.—Sir James J. Dobbie.

As Vice-Presidents who have filled the Office of President.—Professor H. E. Armstrong, Professor A. Crum Brown, Sir William Crookes, Sir James Dewar, Professor Harold B. Dixon, Professor Percy F. Frankland, Dr. A. G. Vernon Harcourt, Professor W. Odling, Professor W. H. Perkin, Sir William J. Pope, Professor J. Emerson Reynolds, Dr. Alexander Scott, Sir Edward Thorpe, and Sir William A. Tilden.

As Treasurer.—Dr. M. O. Forster.

As Secretaries.—Dr. Samuel Smiles and Professor J. C. Philip.

As Foreign Secretary.—Lt.-Colonel Arthur W. Crossley.

As Vice-Presidents.—Professor F. G. Donnan, Dr. H. J. H. Fenton, Lt.-Colonel A. Smithells, Professor James Walker, Professor W. P. Wynne, and Professor Sydney Young.

As New Ordinary Members of Council.—Professor F. E. Francis, Mr. J. A. Gardner, Dr. C. A. Keane, and Sir Robert Robertson.

Mr. C. F. Cross, Mr. A. R. Ling, and Dr. G. Senter were elected Auditors to audit the Society's Accounts.

Dr. A. Bramley and Mr. P. Edgerton were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Pierre Beghin.
Walter Richard Berry, B.Sc.
Reginald Christopher Bickmore.
Harry Blackman.
Philip Blackman.
Harold Samuel Bolton.
Stanley Edward Bowrey, B.Sc.
Solomon Nathan Brown.
John Joseph Bryant.
Alan Chamley Burns, B.Sc.Tech.
George Butterworth.
Harold Frank Cabell, B.Sc.
William Harold Squier Cheavin.
John Arthur Clements.
Edward Charles Cull, B.Sc.
Vishwanath Ganesh Dani, B.A.
Thomas Robert Dixon.
John Campbell Earl.
Percy Edwin Evans, M.A.
Alfred Farmbrough.
James Darnell Granger, Ph.D.
Algie Hancock.
Walter Arthur Nelson Hardwick.
Benjamin Richard Heasman, B.Sc.
George Samuel Heaven, B.Sc.
James Rintoul Higham.
Geoffrey Isherwood Higson, M.Sc.
Frederick William Hodkin, B.Sc.
Harry Jephcott, M.Sc.
André Job.
Richard Edward Johnston.
Edward Likiernik, B.Sc.
Francis Fredk. Mooney.
Sydney Walter Morris.
Charles Moureu.
William Aorian Thomas Nash.
Parnell Stanley O'Dowd.
John Parrish, B.Sc.Tech.
Francis Falconer Peet, B.Sc.
Ernest Ed. Pendlebury.
Frank Radcliffe, M.B., B.S.
Josslyn Vere Ramsden.
Albert Riley, B.Sc.
Thomas John Samuel.
Frank Comer Savage.
Ernest Shepherd, B.Sc.
Arthur John Griffiths Smout.
Edward Tyghe Sterne.
Hugh Vernon Thompson, M.A.
Rupert Harry Truelove, B.Sc.
Frederick Wilson Walker.
Francis Henry Sweeting Warneford, B.Sc., B.A.
Walter Henry Watson, B.Sc.
Leo Daft Williams.
Greatrex Johnson Woods.
Charles Thomas Woosnam, M.A.

The following paper was read:

"Nitro-, arylazo-, and amino-glyoxalines." By R. G. FARGHER and F. L. PYMAN.

LECTURE.

The next Ordinary Scientific Meeting of the Society will be held on Thursday, March 6th, at 8 p.m., when Professor J. W. Nicholson, F.R.S., will deliver his Lecture, entitled "Emission Spectra and Atomic Structure."

ANNUAL GENERAL MEETING.

Fellows are reminded that the Annual General Meeting will be held on Thursday, March 27th, *at* 4 *o'clock* (not 4.30 p.m., as announced on the Meeting Card). The Council has decided to hold the Anniversary Dinner that evening at 6.45 for 7 o'clock in the Connaught Rooms, Great Queen Street, W.C.2. Consequently, the Informal Meeting arranged to be held at 8 o'clock that evening has been cancelled.

Applications for Dinner Tickets (price 10*s*. 6*d*. each) for Fellows and their guests should be made as soon as possible to the Assistant Secretary.

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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, March 6th, 1919, at 8 p.m., Sir William J. Pope, K.B.E., F.R.S., President, in the Chair.

The President announced that Professor Dr. T. Schlœsing, who was elected an Honorary and Foreign Member on June 16th, 1892, died on February 8th last, and that Mr. Harry Shulman, who was elected a Fellow on February 18th, 1915, had died on February 22nd.

Messrs. G. J. Woods, F. C. Savage, N. Makower, R. Bickmore, G. Higson, W. A. Nash, B. R. Heasman, C. Diamond, F. Peet, and W. C. Peck were formally admitted as Fellows of the Chemical Society.

The names of the Fellows recommended by the Council for election as Officers and as Ordinary Members of Council for 1919—1920 were read from the Chair.

Certificates were read for the first time in favour of:

William Herbert Fletcher Armstrong, B.A., Khalsa College, Amritsa, India.
Walter Hatton Crouch, 67, Wellington Road, Wanstead, Essex.
James Ross Fraser, 13, Archibald Road, Tufnell Park, N. 7.
James Edward Grainger, Lennards, Rainham, Essex.
John Henry Harvey, Ravensworth, Llantarnam, Newport, Mon.
George Armand Robert Kon, B.A., 79, Cromwell Road, S.W. 7.
Walter Shepherd, 103, Spotland Road, Rochdale.
Walter Bernard Smith, B.Sc., Marlborough College, Wilts.
Ernest Henry Stenning, King William's College, Isle of Man.

Frederick Thomas Stevenson, 48, Strathnairn Street, Bermondsey, S.E.
Ralph William Ewart Stickings, B.Sc., Soudley House, Wandle Road, Morden, Mitcham.
Stanley Goulden Thompson, 1, Thorn Bank, Manchester Road, Buxton, Derbyshire.
Harold George Tribley, Yetminster, Sherborne, Dorset.
Albert Edward Wallis, "Hillside," Sunbridge, Sevenoaks, Kent.

A Certificate for election has been authorised by the Council for presentation to ballot under Bye-Law I(3) in favour of:

David M. Davies, H.M.S. *Cyclops*, c/o G.P.O.

Professor J. W. Nicholson, M.A., D.Sc., F.R.S., then delivered his Lecture, entitled "Emission Spectra and Atomic Structure." A vote of thanks to Professor Nicholson for his lecture, proposed by Prof. W. H. Bragg, F.R.S., and seconded by Sir James J. Dobbie, F.R.S., was carried with acclamation.

Ordinary Scientific Meeting, Thursday, March 20th, 1919, at 8 p.m., SIR WILLIAM J. POPE, K.B.E., F.R.S., President, in the Chair.

Certificates were read for the first time in favour of:

William Henry Barrett, Rossall School, Fleetwood.
Robert Macfarlane Clark, B.Sc., 138, Bath Street, Glasgow.
Harry Eade Dear, B.Sc., Littlecote, Widemouth Bay, Bude, Cornwall.
Surindra Nath Dey, B.A., 38/1, Nilmony Mitter Street, Beadon Square, P.O., Calcutta, India.
Reginald Gordon Doyle, 28, Newlands Park, Sydenham, S.E.26.
Frederick Freeth, 17, Victoria Road, Stockton Heath, Cheshire.
Frederick John Spencer Hall, 4, York Road, Forest Gate, E.7.
Edward John Jones, 8, Windsor Street, Uplands, Swansea.
Frederick George Mann, B.Sc., 21, Thurlby Road, W. Norwood, S.E.27.
George Stanley Withers Marlow, B.Sc., 37, Collington Road, Sydenham, S.E.26.
Frank Matthews, B.Sc., 12, Hurlingham Court Mansions, S.W.6.
James Morris, 23, Brynymor Crescent, Swansea.
Marriappa Parthasarathy, 21, Maligakande, Colombo, Ceylon.
John David McBeath Ross, M.A., B.Sc., 9, Ruskin Walk, Herne Hill, S.E.24.
Kalyan Chennakesava Srinivasan, M.A., Niton, 34, Pycroft's Road, Madras, S.E., S. India.
Cyril Heath Stephenson, B.A., Darley Green, Knowle, Warwickshire.
Ernest Turner, B.Sc., 28, Shrewsbury Terrace, South Shields
Walter Wahl, Academy, Åbo, Finland.
Orr Walker, 29, Camden Street, Belfast.

The following papers were read :

"The rotatory dispersive power of organic compounds. Part IX. Simple rotatory dispersion in the terpene series." By T. M. LOWRY and H. H. ABRAM.

"The formation and stability of *spiro*-compounds. Part II. Bridged-*spiro*-compounds derived from *cyclo*hexane." By C. K. INGOLD and J. F. THORPE.

The next Ordinary Scientific Meeting will be held on April 3rd, 1919, at 8 p.m.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY MEETING ON THURSDAY, MAY 1ST, 1919.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ANDREWS, LIONEL CONRAD, Cressingham House, Carshalton, Surrey. Analytical and research chemist to Messrs. J. Rank, Ltd. (flour millers), Baltic House, Leadenhall Street. Training in general and biological chemistry, King's College, 1908–1913. Bacteriological research on "Thermophylic Bacteria," under Board of Agriculture scholarship 1913–1914 (unpublished on account of the war). Chemist to Messrs. Truman, Hanbury and Buxton (brewers), 1914–1915; assistant chemist at N.P.L. (on steel analysis), 1915; analytical and research chemist to Messrs. J. Rank, Ltd. (flour millers) 1916 to date; research on gluten, properties of flour, substitutes and improvers for, and research on "Ropy Bacteria." B.Sc. (Hons. Lond.), A.I.C., D.B.E.A. (*Signed by*) Patrick H. Kirkaldy, L. E. Hinkel, Henry L. Smith, Herbert Jackson, John M. Thomson.

ANFILOGOFF, NICHOLAS LIONEL, Lathol House, Thames Haven, Essex. Third year student of applied chemistry at the City and Guilds Technical College, Finsbury, and am desirous of the use of the Society's Library, and of keeping in touch with current chemical literature. (*Signed by*) G. T. Morgan, N. A. Anfilogoff, H. M. Atkinson, A. J. Hale, T. S. Singer.

ARMSTRONG, WILLIAM HERBERT FLETCHER, Khalsa College, Amritsar, India. Professor of Chemistry. Late Foundation Scholar of Downing College, Cambridge. B.A. 1913; M.A. 1919. (Natural Sciences Tripos, Parts I. and II.) (*Signed by*) W. J. Pope, C. T. Heycock, W. H. Mills, A. J. Berry, *F. W. Dootson*.

BARRETT, WILLIAM HENRY, Rossall School, Fleetwood. Senior Science Master at Rossall School. Engaged in teaching and original research in chemistry, part author of several contributions to the Journal of the Society. (*Signed by*) F. D. Chattaway, A. F. Walden, J. E. Marsh, Fredk. A. Mason, W. H. Perkin, B. Lambert, N. V. Sidgwick.

BLOOM, EDWARD, 61, Berwick Street, London, W.1. I intend to

go in for technical chemistry. I desire to be admitted into the Chemical Society in order to keep in touch with modern developments of all parts of scientific chemistry. I have the degree of Bachelor of Science (London University) with Second Class Honours. (*Signed by*) Frank E. Weston, F. G. Pope, W. H. Collier, F. Barrow, *G. H. Martin*, *H. D. K. Drew*.

BRASH, WILLIAM, 53, Aynhoe Road, W. Kensington, W. 14. Chemist. B.Sc., A.R.C.S. (Lond.) 1914–1919, assistant chemist, Government Laboratory. (*Signed by*) James J. Dobbie, Geo. Stubbs, J. J. Fox, E. Grant Hooper, C. S. Grace.

BURWELL, ROBERT PARMENTER, B.Sc., A.I.C., 92, Southtown Road, Great Yarmouth. Works chemist, New Explosives Co., Stowmarket. Seven years' experience as a teacher of chemistry. Two years with the New Explosives Co. (*Signed by*) Frank Browne, Charles W. Carpenter, W. J. Lund, *E. G. Bainbridge*, *Charles E. Potter*.

CLARK, ROBERT MACFARLANE, B.Sc., F.I.C., 138, Bath Street, Glasgow. Analytical and consulting chemist. Sole partner in firm of Wallace and Clark, analytical and consulting chemists. Public analyst for the counties of Lanark and Renfrew, and a number of burghs. President of Association of Public Analysts of Scotland, member of Society of Public Analysts, Society of Chemical Industry, etc., (*Signed by*) John Wm. Biggart, J. F. Tocher, R. T. Thomson, William Love Biggart, Stevenson Macadam.

COHEN, ISAAC, 50, Redmans Road, E.1. Student. Passed Intermediate B.Sc., June, 1917 (University of London). I am a third year student of chemistry at East London College, and I shall sit for the B.Sc. Honours Chemistry in October, 1919. I am also taking a course of biology at Birkbeck College (London), with the intention of making a special study of the chemistry of medicine. (*Signed by*) Jules Cofman-Nicoresti, F. G. Pope, Hugh C. H. Candy, *George Senter*, *G. H. Martin*.

CROUCH, WALTER HATTON, 67, Wellington Road, Wanstead, Essex. Chemist. 1904–1909, chief assistant in the Chemical Laboratories, Guy's Hospital, under the late Dr. John Wade, F.I.C.; 1909–1917, assistant analyst, Admiralty Chemists' Department, Portsmouth; 1917, first assistant chemist (Ministry of Munitions), Petroleum Research Laboratory; 1918, chief chemist, Ministry of Munitions, Mineral Oil Production Department, Laboratory, Royal School of Mines, South Kensington. (*Signed by*) Boverton Redwood, Robert Redwood, Arnold Philip, J. T. Pattison, Frank Wade, Robt. Ensoll.

DEAR, HARRY EADE, "Littlecote," Widemouth Bay, Bude, Cornwall. Science Master. B.Sc. Hons. Chem. London; Assoc. Chemistry, Bristol; science master, Bala Grammar School; science master, County School, Bude, prior to war. Four years' active service in Artillery. M.C. (*Signed by*) J. Wertheimer, F. C. Dyche-Teague, Ernest Stedman, Ernest H. Cook, *A. H. M. Muter*.

DEY, SURENDRA NATH, 38/1, Nilmony Mitter Street, Beadon Square P.O., Calcutta, India. Chemical assistant to the Sanitary Commissioner, Bengal. B.A. in Chemistry and Physics (Calcutta University); diploma holder, Higher Agricultural Course, Sibpur Civil Engineering College, Bengal; teacher on chemistry and physics, Uttarpara Government School; lecturer on physics and chemistry, Apprentice Department, Sibpur Civil Engineering College; analytical chemist since 1904; author of a small brochure on *Cochlospermum gossypium* (Agricultural Ledger No. 5, 1906, Government of India publications). At present chemical assistant to the Sanitary Commissioner, Bengal.

(*Signed by*) P. Bruhl, Nalini Mohan Gupta, Tin Kari Ghose, David Hooper, *B. B. Dey, J. Bhaduri.*

DHAR, SURENDRANATH, 21, Cromwell Road, South Kensington. Student. A Government research scholar from 1915 to 1917; lecturer on chemistry in A.M. College, Mymensingh, Calcutta University. At present Government of India Research Scholar in the Imperial College of Science and Technology. Author of a paper on "Some Xanthone Derivatives and Xanthone Colouring Matters." T. 1916, vol. 109, p. 744–750. (*Signed by*) E. R. Watson, Jocelyn Thorpe, James C. Philip, H. B. Baker, P. W. Robertson.

DOYLE, REGINALD GORDON, "The Larches," 28, Newlands Park, Sydenham, S.E.26. Mining Engineer. At present engaged by the Ministry of Munitions in an experimental laboratory; educated City of London School, 8 years; last 3½ years science side under the late Henry Durham, F.C.S.; 3 years Camborne School of Metalliferous Mining; first class diploma, which includes first class assaying, mineralogy, and metallurgy; 1½ years assistant assayer, Consolidated Main Reef Mine, Johannesburg. (*Signed by*) J. Ewart T. Barbary, S. Sugden, Oscar L. Brady, K. C. Browning, P. E. Evans.

FRASER, JAMES ROSS, 13, Archibald Road, Tufnell Park, N.7. Student of Chemistry. Being a student of applied chemistry at the Finsbury Technical College, I am desirous of obtaining the publications of the Society and of utilising the means afforded of keeping in touch with chemical current developments. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, Bernard Jeffs, J. W. Reginald Youall.

FREETH, FREDERICK, 17, Victoria Road, Stockton Heath, Cheshire. Technical chemist and assistant works manager, Messrs. J. Crosfield and Sons, Ltd., soap manufacturers, Warrington. Twelve years' laboratory and works experience at home and abroad. (*Signed by*) E. F. Armstrong, John Allan, T. P. Hilditch, Chas. W. Moore, H. J. Wheaton.

GARROD, RALPH EDDOWES, 5, College Gardens, Dulwich Village, S.E.21. Technical and Research Chemist. Scholarship in Natural Science, Clare College, Cambridge, 1907; Natural Sciences Tripos, Parts I. and II. M.A. (Cantab). One year's research work. Joint author of two papers in *Journal Chem. Soc.*, 1912, vol. 101. Chemist (since 1912) to Messrs. C. W. Martin and Sons, Bermondsey, fur skin dyers. Research chemist (War Office) since 1916. (*Signed by*) S. W. Collins, P. Haas, H. Bassett (jun.), L. E. Hinkel, Thomas R. Merton, *Samuel Smiles.*

GRAINGER, JAMES EDWARD, Lennards, Rainham, Essex. Chemical engineer. I have been connected with manufacturing chemistry for the past ten years, the first four and a half years at the Beckton Chemical Works, where I had experience in analytical work in the laboratory and on the chemical plants. The last five and a half years I have been in charge of the chemical side of the coal-tar product plants erected by the Chemical Engineering Co. (*Signed by*) Harold G. Colman, J. H. Canning, Arthur Marsden, S. E. Whitehead, *H. M. Dawson, Daniel J. O'Mahony.*

GRIFFITHS, EDGAR THOMAS, 100, Commercial Street, Tredegar, Mon. Dispensing Chemist. I was a student at the South of England College of Pharmacy, 186, Clapham Road, London, S.W., from September, 1910, to April, 1911, during which time I was engaged in theoretical and practical chemistry, after which I passed the qualifying examination of the Pharmaceutical Society. Since when I have given much time to the standardising of galenical preparations. I also wish to become a Fellow of the Society so that I can avail myself of the advantages to be derived therefrom and keep

myself apace of the times. (*Signed by*) Frederick Watkins Evans, Harry Lucas, Kenneth S. Dickinson, *H. Wippell Gadd, F. Southerden.*

GRIFFITHS, THOMAS OWEN, "Hazelwood," Erskine Road, Colwyn Bay. Research Chemist and Technical Master. Research chemist at H.M. Factory, Oldbury, for three years. B.Sc. (Lond.), 1915. University training at the University College of N. Wales, Bangor. Senior science and mathematical master at the Abergele County School. (*Signed by*) Harry W. Webb, George B. Stones, W. A. S. Calder, John Trotter, Harold A. Scarborough.

HAIGH, THOMAS, 15, Cavendish Avenue, Church End, Finchley, N.3. Research Chemist. B.A. (N.U.I.); A.R.C.Sc.I.; A.I.C.; lecturer in chemistry, Cork Grammar School, 1908–1912; chemist and analyst to H.M. Geological Survey of Ireland, 1912–1914; research chemist, Ministry of Munitions, O.M.G. (present occupation). (*Signed by*) Jos. Reilly, H. M. Atkinson, W. D. Haigh, J. H. Cooke, Arnold Stevenson, Herbert Jackson.

HALL, CHARLES, Woodbridge School. Science Master. First class advanced certificates of Board of Education in practical and theoretical chemistry. (*Signed by*) W. G. Gledhill, R. O. Burland, T. H. Winstanley, *M. M. Pattison Muir, John Webster.*

HALL, FREDK. JOHN SPENCER, 4, York Road, Forest Gate, E.7. Chemist (analytical and works). Previous: student at Coopers' Co.'s School, Bow, and West Ham Technical Institute; formerly: pupil assistant to Dr. H. P. Stevens, M.D., F.I.C., F.C.S., 15, Boro', S.E.; now chemist to Sarsons, Ltd. (vinegar brewers), City Road, N. (*Signed by*) F. H. Streatfeild, George Dean, H Jephcott, Henry P. Stevens, *A. Chaston Chapman, Cecil H. Cribb.*

HART, VERNON PERCY, 42, Park Grove, Portway, West Ham, E.15. Works Chemist. Five years works chemist (Commercial Gas Company, Wapping Station), and four years works chemist at South Metropolitan Gas Company, East Greenwich Station). (*Signed by*) Charles Wesley Bayley, Henry T. F. Rhodes, Harry Shulman, *Roland J. May, Fredk. Stanley Baxter.*

HARVEY, JOHN HENRY, "Ravensworth," Llantarnam, Newport, Mon. Headmaster of Boys' School. Elementary certificate (inorganic chemistry), theoretical and practical, Board of Education (South Kensington); advanced certificate (practical and theoretical), inorganic chemistry, Board of Education (South Kensington); teacher of chemistry for sixteen years. (*Signed by*) Léon E. Walling, Will. T. Boone, John Taylor, *H. E. Dryden, Frederick W. Evans.*

HOCKING, FREDERICK DENISON MAURICE, 18, Woodside Park Road, N. Finchley, N.12. Third year student of applied chemistry at the City and Guilds Technical College, Finsbury, and am desirous of the use of the Society's Library, and of keeping in touch with current chemical literature. (*Signed by*) G. T. Morgan, N. A. Anfilogoff, H. M. Atkinson, A. J. Hale, H. Singer.

HODGSON, GEORGE HUGH, 41, Roach Road, Sheffield. Metallurgical Chemist. (Present date) chief analyst, Munition Areas Inspection Department; Ministry of Munitions Laboratory, Sheffield; five years Naval Ordnance Inspection Department, *i.e.*, two years chief analyst in charge, Admiralty Laboratory, Birmingham; three years senior assistant, Laboratory. H.M. Inspector of Steel, Sheffield; six years laboratories in research departments, and works experience with metallurgical and engineering firms, including the Daimler Co. and Cammell, Laird and Co.; four years University of Sheffield; associate course in metallurgy and allied subjects. (*Signed by*) G. S. Blake, Harry Silvester, Thomas Turner, C. H. Ridsdale, *J. E. Stead, H. Frankland, Ernest W. Jackson, N. D. Ridsdale.*

HOPKINS, SIDNEY JOHN, London House, Hambledon, Hants. Student of Applied Chemistry, City and Guilds Technical College, Finsbury. As a third year student of the above college I am desirous of keeping in touch with current chemical literature and research. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, J. W. Reginald Youll, Bernard Jeffs.

HOUSSA, ARMAND, 11, Tremadoc Road, Clapham, London, S.W.4. Assistant Lecturer and Demonstrator in Chemistry. B.Sc., Second Class Hons. Chemistry (London), 1918; member of Society of Chemical Industry; at present assistant lecturer and demonstrator in chemistry at Battersea Polytechnic. Desires to take the Journal of the Society and to have use of the Library. (*Signed by*) J. Wilson, J. L. White, J. Hart-Smith, J. H. Johnston, W. C. Peck.

HUGHES, FRED, 1, Hope Street, Runcorn, Cheshire. Science Master, Liverpoor College, teaching mathematics, physics, chemistry. Two years junior assistant; four and a half years head assistant chemical laboratories, Liverpool University; one term as science master, Liverpool College, 1917; now permanent. First class (distinction), first stage organic chemistry (Lanc. and Ches.); pass in lower stage alkali manufacture (City and Guilds); pass in organic and inorganic (lower), Board of Education; (passed London Matriculation, January, 1917); assisted in preparation of substances for "Polysulphides of Sodium," J. S. Thomas and Alex. Rule, J.C.S., December, 1917. (*Signed by*) E. C. C. Baly, R. Robinson, H. H. Froysell, J. Lea, H. H. Donaldson.

JONES, EDWARD JOHN, 8, Windsor Street, Uplands, Swansea. Assayer and Analytical Chemist. Connected with Messrs. J. S. Merry and Co., assayers and analytical chemists, for thirty years, for the latter fifteen years as one of the principal assistants. Since December, 1917, succeeded, in conjunction with Mr. James Morris, to a partnership in the above-named firm. (*Signed by*) Clarence A. Seyler, D. T. Williams, E. Anderson, *B. Perrott, J. H. Duncan.*

KON, GEORGE ARMAND ROBERT, 79, Cromwell Road, S.W.7. Research Student. B.A. Cantab. (Second Class Honours, 1912); D.I.C. for research in organic chemistry, 1916; at present engaged on research in organic chemistry. (*Signed by*) James C. Philip, H. B. Baker, Jocelyn Thorpe, Oscar L. Brady, Kenneth Hickman.

LONG, HENRY LAWRENCE, 19, Seward Road, Hanwell, London, W.7. Chemist. Educated at Southall County School, 1908–1914; held the Drapers' Science Scholarship at East London College, University of London, 1914–1916; B.Sc. First Class Honours in Chemistry, 1916; analytical and superintending works chemist (acid section), Nobel's Explosives Company, 1916–1918. (*Signed by*) J. T. Hewitt, Clarence Smith, F. G. Pope, M. O. Forster, Wm. Rintoul, Norman Picton, William Barbour, Julian L. Baker.

MCHUTCHISON, WILLIAM, 108 City Road, Edgbaston, Birmingham. Works Chemist. B.Sc. (Glasgow); A.I.C. Since November 15th, 1915, at H.M. Factory, Site B, Oldbury, Birmingham; chemist-in-charge, T.N.T. Department, C.I.C., M.M.T. Department, and latterly as site superintendent. Publication: "The Precipitation of Trinitrotoluene from Concentrated Acid Solution by Means of Water," *J. Soc. Chem. Ind.*, July 31, 1915. (*Signed by*) F. P. Dunn, F. W. Jackson, R. E. Forbester, H. E. Smith, C. Bride.

MCINTYRE, WILLIAM ANGUS, A.R.C.Sc., B.Sc., Lt. R.E., 18, Leinster Avenue, East Sheen, S.W.14. Geologist. Passed B.Sc. with chemistry as subsidiary subject. Keenly desirous of keeping in touch with advances in physical chemistry and of using the Society's Library. About to undertake

research in physical chemistry in connexion with some problems in geology. (*Signed by*) James C. Philip, John Wilson, Cecil Hollins, J. L. White, *F. W. Branson.*

McNaughton, John Alexander, "Birkwood," Redhill, Castleford, Yorks. Works Chemist. Works chemist (three years), Hickson and Partners, Ltd., Castleford; Ernest Hickson, drysalter, Bradford (one year). Took three years' day and evening course, Bradford Technical College; awarded systematic evening course certificate in chemistry; City and Guilds' certificate in cotton and wool dyeing. (*Signed by*) Walter M. Gardner, Barker North, William M. Nichols, *T. Slater Price, H. D. K. Drew, H. C. Cocks.*

Mann, Frederick George, B.Sc., 21 Thurlby Road, W. Norwood, S.E.27. Student. B.Sc. (War.). I wish to be admitted to the Society in order to use the Library and to take in the Journal. (*Signed by*) J. L. White, J. Hart-Smith, J. Wilson, W. C. Peck, J. H. Johnston.

Marlow, George Stanley Withers, 37, Collingtree Road, Sydenham, S.E.26. Analytical Chemist. Educated at King's College, London; obtained Daniell Research Exhibition; for two years assistant to Ed. Hinks, Public Analyst for Surrey; since 1911 engaged at the Government Laboratory, since 1912 as an established staff analyst; B.Sc. (Hons. Chem.), F.I.C. (*Signed by*) A. G. Francis, Geo. Stubbs, A. J. H. Gauge, P. J. Sageman, J. H. Robbins.

Matthews, Frank. 12, Hurlingham Court Mansions, S.W.6. Teacher. Teacher and student Univ. Coll. Lond., 1905–8, S.W. Polytechnic, 1908–1919; B.Sc., 1908; A.I.C., 1918. Part author with Dr. J. C. Crocker, M.A., of "The Picraminobenzoic Acids and their Derivatives," *J.C.S.* Trans. (*Signed by*) J. B. Coleman, F. H. Lowe, H. Jephcott, Frank E. Weston, W. H. Collier, J. C. Crocker.

Mellins, Samuel, 50, Great Garden Street, London, E.1. Student of Chemistry at the East London College, Mile End, E.1. Member of the Pharmaceutical Society of Great Britain. Passed Intermediate B.Sc., and intend sitting for B.Sc. (final) (Honours Chemistry) in October, 1919. Am desirous of following up developments of modern chemistry. (*Signed by*) Harry Lucas, F. G. Pope, J. Tavroges, Hugh C. H. Candy, *F. C. Wood.*

Mendel, Lazarus, 25, Broadway, West Ealing, London, W.13. Student of Applied Chemistry, City and Guilds Technical College, Finsbury. Being a student of the Institute of Chemistry and third year student of the above college, I desire to have the use of the Society's Library, and to keep in touch with current chemical literature and research. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, Bernard Jeffs, J. W. Reginald Youll.

Moorhouse, Francis William, 57, Frodingham Road, Scunthorpe. Metallurgical Chemist. London matriculation, January, 1916; 16 months with F. W. Richardson, F.I.C., Public Analyst for the W.R. of Yorks, etc.; 3½ years chemist, rising to first assistant in laboratory of the blast furnace plant, Appleby Iron Co., Scunthorpe. (*Signed by*) F. W. Richardson, A. Jaffé, Wm. Keighley Walton, Geoffrey A. Bracewell, *H. E. Aykroyd.*

Morris, James, 23, Brynymôr Crescent, Swansea. Assayer and Analytical Chemist. Served a pupilage of 6 years under the late Mr. J. S. Merry, F.C.S., Swansea, subsequently acting as assistant with Messrs. J. S. Merry and Co. for a period of 40 years, and in December, 1917, succeeded to a partnership in the above-named firm. (*Signed by*) Clarence A. Seyler, D. T. Williams, E. Anderson, *B. Parrott, J. H. Duncan.*

Moudgill, Kishori Lal, Christ's College, Cambridge. Research Student.

Graduate in pure science (B.Sc.) of Glasgow University, with special distinction in chemistry; a paper on the "Specific Rotation of Dibenzoyl Diethyl *d*-Tartrate in Different Solvents" in the *Proceedings* of the Royal Society of Edinburgh is in the course of publication; research work in Glasgow, 1915–1917, and in Cambridge, 1917, to this date. (*Signed by*) W. J. Pope, W. H. Mills, C. S. Gibson, E. E. Turner, J. Krizewsky.

PARTHASARATHY, MARRIAPPA, 21, Maligakande, Colombo, Ceylon. First Assistant to Government Analyst. 1900, passed out as apothecary of the Ceylon Medical College; 1900, appointed as apothecary to the Government Medical Stores; 1908, appointed as second assistant to the Government Analyst, Colombo, and was trained by Professor K. C. Browning, M.A.; 1910, appointed as first assistant to Government Analyst, Colombo. (*Signed by*) K. C. Browning, P. E. Evans, A. F. Joseph, Harold E. Temple, *H. A. Wootton, E. de W. S. Colver, W. R. Hopkinson.*

RAY, RAMES CHANDRA, Moradpur P.O., Bankipore, India. Professor of Chemistry, Patna College, Moradpur P.O., Bankipore, India. M.Sc. of the Calcutta University; Associate Indian Institute of Science, Bangalore (India); papers: (1) "Borohydrates," Part I., *Proc. Roy. Soc.*, 87A, 1912, 163, with Dr. M. W. Travers, F.R.S.; (2) "Amorphous Boron and Magnesium Boride," *J.C.S.*, 1914, 105, 2162; (3) "The Compound $H_2B_4O_6$ and its Salts," *J.C.S.*, 1918, 113, 803. (*Signed by*) J. J. Sudborough, B. B. Dhavale, H. E. Watson, G. B. Kolhatker, P. Neogi, *Bawa Kartar Singh.*

ROSS, JOHN DAVID MCBEATH, 9, Ruskin Walk, Herne Hill, London, S.E.24. Research Chemist and Demonstrator in Chemistry. M.A., B.Sc., of Edinburgh University; Vans Dunlop Scholar, 1912–14; 1851 Exhibition Scholar, 1914–17; assistant research chemist under Chemical Warfare Department, 1915–18; demonstrator in chemistry at Imperial College of Science and Technology. (*Signed by*) James C. Philip, H. B. Baker, James Walker, Sydney A. Kay, H. G. Rule.

SEN, HARI DAS, Nawabganj, Cawnpore, India. Senior Assistant Chemist, Opium Research Laboratory, Agricultural College, Cawnpore. M.Sc. (Calcutta), with organic chemistry as special subject (1914); research work under Prof. P. C. Ray, C.I.E., Ph.D., etc., at the Presidency College, Calcutta (1912–14), and at the Indian Association for the Cultivation of Science (1914); entered Government Excise Laboratories as assistant (1915); experience in factory work in the distillery of Messrs. Carew and Co., Asansol, Bengal (1915); manager, Manpur Distillery, Behar (1916); appointed senior assistant to the Agricultural Chemist to Government of Bengal on special duty in United Provinces in connexion with opium research work (November, 1916). (*Signed by*) H. E. Annett, Jatindra Nath Sen, E. Clarke, S. C. Banerji, E. L. Watson.

SHEPHERD, WALTER, 103, Spotland Road, Rochdale. Analyst. For 12 years assistant to Robt. W. Oddy, Esq., F.I.C., F.C.S., analytical and consulting chemist, The Laboratory, Abbey Street, Rochdale, during which period I was engaged in the analysis of food and drugs and products used in the textile industry; for five sessions was assistant to G. G. Quinn, Esq., A.R.C.Sc. (Lond.), at the Rochdale Technical School (evening classes); since 1915 I have been attached to the Special Brigade, Royal Engineers (Chemical Corps). (*Signed by*) Robt. W. Oddy, Robt. A. Oddy, G. G. Quinn, W. J. Lund, John E. Doodson.

SINGER, NATHAN, 147, Upper Clapton Road, London, E.5. Student of Applied Chemistry, City and Guilds Technical College, Finsbury. Being a third-year student of the above college, I am desirous of keeping in touch with current chemical literature and research. (*Signed by*) G. T. Morgan,

A. J. Hale, H. M. Atkinson, Percy Edgerton, J. W. Reginald Youll, Bernard Jeffs.

SMITH, WALTER BERNARD, Marlborough College, Wilts. Science Master. Teacher of chemistry at Denstone College, 1905 to April, 1918; teacher of chemistry at Marlborough College since May, 1918; B.Sc., London. (*Signed by*) Reginald G. Durrant, J. E. Shum Tuckett, W. A. Knight, *Samuel Smiles*, *James C. Philip*.

SRINIVASAN, KALYAN CHENNAKESAVA, M.A. (Madras), Niton, 34, Pycroft's Road, Madras, S.E., S. India. Government Leather Chemist, Department of Industries. Chemistry assistant, Leather Trades Institute, Madras; first class honours man and Prince of Wales' medallist in chemistry of the University of Madras; University Marsh Scholar for chemistry, 1914–17; research worker for the Indian Munitions Board, Simla, on "The Technology of Glue Manufacture in the Tropics" and a "Simpler Method of Tannin Analysis." (*Signed by*) J. J. Sudborough, H. E. Watson, F. L. Usher, J. L. Simonsen, Gilbert J. Fowler.

STENNING, ERNEST HENRY, King William's College, Isle of Man. Clerk in Holy Orders, Senior Science Master, King William's College. Scholar of Downing College, Cambridge, 1906; Major Science Scholar, Kent County Council, 1904; Natural Sciences Tripos, Cambridge, 1909; life member of the Association of Public School Science Masters; senior science master, King William's College, and founder of the medical side of the school. (*Signed by*) W. J. Pope, Charles T. Heycock, Fred. R. Grundey, A. J. Berry, *W. J. Lewis*.

STEPHENSON, CYRIL HEATH, Darley Green, Knowle, Warwickshire. Works Chemist. Chief chemist, Component Munitions, Ltd., Tyseley, Birmingham; B.A. (Cantab), F.R.A.S., member of the Faraday Society. (*Signed by*) F. W. Harbord, A. L. Bacharach, A. J. Cooper, *Kenneth S. Dickinson*, *H. J. H. Fenton*.

STERNE, EDMUND JOSEPH, Felsham, Bury St. Edmunds, Suffolk. Assistant Chemist (Analytical). Assistant chemist, 1916–March, 1918, at Messrs. Kynoch's explosive and chemical works, Arklow, Ireland; assistant chemist, March, 1918, at Directorate of Chemical Inspection, Ministry of Munitions (attached Royal Arsenal, Woolwich); hold London Int. B.Sc. (honours chemistry) exam. certificate. (*Signed by*) Robt. L. Brown, Robert B. Pettigrew, Frank N. Harrap, *Alexander Porter*, *W. L. Baillie*.

STEVENSON, FREDERICK THOMAS, 48, Strathnairn Street, Bermondsey, S.E. Works Chemist. Studied chemistry three years at Borough Polytechnic Institute under Dr. C. Dorée, and have obtained two first class (inorganic and organic) and second class (inorganic) certificates in chemistry; was appointed works chemist to Messrs. Sparks, White and Co., Ltd., London, in August, 1913, the position which I still hold; I am at present at research work, on sugars and their derivatives, besides investigating commercial essential oils; I am interested in all branches of the science and am desirous of obtaining the Society's journals and publications. (*Signed by*) Charles Dorée, C. T. Bennett, Gerald Druce, H. Trewby, *Charles A. Keane*.

STICKINGS, RALPH WILLIAM EWART, Soudley House, Wandle Road, Morden, Mitcham, Surrey. Research Chemist, at present Captain R.A.M.C., T.F. Senior chemist, No. 1 Water Tank Co., B.E.F., France. B.Sc. (first class honours chemistry, London), D.I.C. (Res.), A.I.C. (research); research on synthetic drugs under Professor J. F. Thorpe at Royal College of Science, 1914–1915; research on water purification under Prof. Baker, F.R.S., ditto; small experience in connexion with rubber pigments and substitutes. (*Signed*

by) H. B. Baker, P. W. Robertson, James C. Philip, Jocelyn Thorpe, A. T. Cameron.

THOMPSON, STANLEY GOULDEN, 1, Thorn Bank, Manchester Road, Buxton, Derbyshire. Dye Chemist at Messrs. Oxley and Hird, Ltd., Lighthouse Chemical Works, Dewsbury Moor, Dewsbury, Yorkshire. Four years at Manchester University studying chemistry under Profs. Dixon and Perkin and Drs. Lean and Bailey; 17 years at Thompson and Co.'s aniline dye works, first testing raw materials, then working out colours in the laboratory, and then making them in the works under L. E. Vlies, F.I.C., and D. Brownlie, B.Sc. (honours) (Lond.), F.C.S., and finally, six years manager of works; now been two years chief dye chemist at Messrs. Oxley and Hird, Ltd., Dewsbury. (*Signed by*) J. C. Cain, Edmund Knecht, H. P. Hird, J. Pomphrey, John C. Oxley.

TRIBLEY, HAROLD GEORGE, Yetminster, Sherborne, Dorset. Student of Chemistry. Being a student of applied chemistry at the Finsbury Technical College, I am desirous of obtaining the publications of the Society and of utilising the means afforded of keeping in touch with chemical current developments. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, Bernard Jeffs, J. W. Reginald Youll.

TURNER, ERNEST, 28, Shrewsbury Terrace, South Shields. Works Chemist. B.Sc., Durham; studying for M.Sc., June, 1919; two years' practical experience as chemist with United Alkali Co., manufacturing sulphuric acid, caustic bleaching powder, sodium sulphite, bisulphite, liquid phosgene and chlorine, arsenic trichloride, etc. (*Signed by*) P. Phillips Bedson, J. A. Smyth, F. G. Henderson, Geo. E. Anderson, *F. O. Garreit.*

VINCE, ALFRED SYDNEY, 30, Ravensbourne Road, Catford, London, S.E.6. R.N. Experimental Section. Civil life, Metallurgical Chemist. Have been a student at Sir John Cass Technical Institute in chemistry and metallurgy; for the past 2¾ years have been engaged with the R.W.E. Section in the construction and working of poison-gas plant, and other chemical plant. (*Signed by*) Harold J. Cross, Charles A. Keane, Henry J. S. Sand, H. D. K. Drew, H. C. Cocks.

WAHL, WALTER, Åbo, Finland. Professor of Chemistry, Academy of Åbo Author of papers on physical chemistry, published Proc. and Trans. of the Royal Society and Oversigt Finska Vetenskapssocietetten. Fellow Finnish Society of Sciences. (*Signed by*) Alexander Scott, W. J. Pope, William A. Tilden, M. O. Forster, *James C. Philip, Samuel Smiles.*

WALKER, ORR, 29, Camden Street, Belfast. Teacher of Chemistry. For four years I have been a student of chemistry at the Municipal Technical Institute, Belfast, attending classes on the theoretical and practical side under Prof. Wren; at the present time I am engaged in a specialised study of the oils, fats, and waxes, and in order to keep in touch with the latest chemical work on the subject, I am desirous of becoming a Fellow of the Chemical Society; for some time I have been conducting classes in chemistry at the Methodist College, Belfast. (*Signed by*) Henry Wren, Ellis Clayton, Howell Williams, Wm. W. Myddleton, Theophilus Harper, *A. Killen Macbeth.*

WALLIS, ALBERT EDWARD, "Hillside," Sundridge, near Sevenoaks, Kent. Chemist (Research). Researches on metallic carbonyls, extraction of nickel from ores, etc., analysis of nickel-copper ores, alloys, salts, etc., precious metal analysis (Dr. Ludwig Mond's laboratories); researches on milk, soils, and feeding-stuffs, general agricultural analysis; bacteriology of milk and soils (Mr. R. Mond's laboratories); manufacturing and theoretical chemistry of explosives at Ministry of Munitions, 1915–1919. (*Signed by*) R. C. Farmer,

H. S. Patterson, J. T. Hewitt, Clarence Smith, W. J. Jones, John N. Vowler.

WALMSLEY, WILLIAM ARTHUR, 17, Elmfield Road, Davenport, Stockport. Chemist. B.Sc. (honours chemistry), Manchester University, 1910; two years as chief works chemist to a firm of sulphuric acid makers and tar distillers and refiners of tar products; six years chief works chemist and manager of works dealing with same products. (*Signed by*) Herbert E. Williams, Arthur F. Campbell, Henry Stephen, Colin Campbell, W. K. Slater, *E. Newbery*.

WEST, DONALD WILLOUGHBY CAPON, Slinfold, Horsham, Sussex. Research Chemist with Ministry of Munitions (Lieut. R.E.), A.C.G.I., A.I.C. Diploma course at City and Guilds (Eng.) College and fourth year research; works chemist with Lever Bros., Port Sunlight (March, 1914–August, 1914); research worker with Ministry of Munitions, shell-filling section and anti-gas (January, 1918–January, 1919). (*Signed by*) Leonard A. Levy, H. S. Raper, W. C. Ball, H. Finnemore, B. Lambert.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (3):

DAVIES, DAVID MERVYN (Paymaster Sub.-Lieut.). H.M.S. *Cyclops*, c/o G.P.O., London. Cynlais House, Treorchy, South Wales, and c/o G.P.O., Winnipeg, Canada. Science Lecturer at Kelvin Technical Collegiate, Winnipeg, up to August, 1914. Cambridge University, studying for B.A. in agricultural science and forestry; Bristol University and Day Training College, Matriculation and first M.B., Ch.B., as well as trained teacher's certificate; Queen's University, Kingston, Ont., subjects, English language and literature, mathematics, chemistry, physics, history, mental and moral philosophy; trained certificated teacher for Manitoba, Saskatchewan, and Alberta, as well as for British Isles; Fellow of Zoological Society, London. (*Signed by*) R. E. Machin, Thos. Wm. Southron.

HAMILL, CLARENCE THOMAS, 606 Walnut Avenue, Syracuse, N.Y. Professor of Forest Utilisation, Syracuse University, College of Forestry, Department of Chemistry. Instructor in chemistry, Brown University; demonstrator, Department of Chemistry, McGill University; assistant professor of chemistry, Montreal College Pharmacy; professor of forest utilisation, College of Forestry, Syracuse University, N.Y. Research: nitrogen fixation with J. E. Bucher; oxalic acid from waste sulphite liquor; preparation of beechwood creosote from wood tar oils; preparation of a decolorising carbon from waste sulphite liquor. Specialities: paper and pulp; hardwood distillation; chemical utilisation of forest products. (*Signed by*) V. J. Harding.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, April 3rd, 1919, at 8 p.m. Sir James J. Dobbie, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, on August 23rd, 1918, of Mr. William Henry Oates, who was elected a Fellow on May 4th, 1893.

It was announced:

(1) That the following Committees for 1919–1920 had been appointed by the Council:

Finance Committee.—Messrs. C. A. Hill, E. G. Hooper, G. T. Moody, Sir William A. Tilden, and the Officers.

House Committee.—Messrs. J. L. Baker, J. E. Reynolds, Alexander Scott, Prof. J. M. Thomson, Sir William A. Tilden, and the Officers.

Library Committee.—Messrs. B. Dyer, J. T. Hewitt, A. R. Ling, T. M. Lowry, J. M. Thomson (Chairman), Sir William A. Tilden, the Editor, Librarian, and Officers, together with the following representatives of contributing Societies: Messrs. J. L. Baker, A. Harden, C. A. Keane, R. L. Mond, R. H. A. Plimmer, G. Senter, and one other.

Publication Committee.—Messrs. A. Chaston Chapman, T. A. Henry, J. T. Hewitt, C. A. Keane, T. M. Lowry, G. T. Morgan, Alexander Scott, J. F. Thorpe, and the Officers.

Research Fund Committee.—Messrs. E. C. C. Baly, F. H. Carr, D. L. Chapman, H. J. H. Fenton, G. G. Henderson, F. S. Kipping, A. Lapworth, W. H. Perkin, Sir W. J. Pope, Alexander Scott, and the Officers.

(2) That an Extraordinary General Meeting of the Society will

be held on Thursday, May 8th, 1919, at 5.30 p.m. to consider the suggested alterations in the Bye-Laws. Further particulars of the meeting will be circulated to Fellows.

(3) That the full scheme for the expansion of the Library will come into operation on May 1st. The Library will thenceforth be open from 10 a.m. to 9 p.m. on every weekday except Saturday, when it will be open from 10 to 5 o'clock.

Messrs. R. Johnston, L. Matthews, L. H. Parker, and E. H. Tripp were formally admitted as Fellows of the Chemical Society.

Certificates for election were read for the first time in favour of:

Wilfrid Andrews Bell, 4 St. Michael's Terrace, Headingley, Leeds.
John Mouson Errington, 41, Fitzroy Street, W.1.
Cecil Godfrey, 46, Mapesbury Road, Cricklewood, N.W.2.
Sidney Herbert Hadfield, 15, East View, Preston.
Herbert Joseph Seymour King, B.Sc., 13, St. James Road, Watford.
Cyril Henry Stanley Kipping, M.A., 40, Magdala Road, Nottingham.
Ernest Neil Macallum, 243, College Street, Toronto, Ontario, Canada.
Denis Madden, 40, Wellington Road, St. Luke's, Cork.
Charles Jean Stanislas van Overstraeten, 38, Cole Park Road, Twickenham.
Sidney Albert Lewis Smith, 85, Portsmouth Road, Woolston, Southampton.
Cyril Richard William Stephenson, M.Sc., Murrayville, Juniper Green, Edinburgh.
Harold Toms, 33, Park Road, S. Wanstead, E.12.
Thomas Thorne Wood, 13, Chester Avenue, Southend on Sea.

A Certificate has been authorised by the Council for presentation to ballot under Bye-law I (3) in favour of:

Alexander Douglas Macallum, 243, College Street, Toronto, Canada.

The following paper was read:

"The resolution of hyoscine and its components, tropic acid and oscine," by HAROLD KING.

ANNIVERSARY DINNER.

The Anniversary Dinner of the Society was held at the Connaught Rooms, Great Queen Street, W.C.2, on Thursday, March 27th, 1919, at 7 o'clock. The following is a list of those Fellows and their Guests who were present:

Adams, M. A.
Albright, G. S.
Alexander, W.
Allen, K. C.
Anderson, G.
Anderson, J.
Armstrong, E. F.
Armstrong, H. E., *Past-President.*
Armstrong, H. L.
Atack, F. W.
Atkinson, R. H.
Atlas, H.
Backers, C. F.
Bacon, W.
Baker, H. B.
Baker, J. L.
Balfour, A.
Ball, W. C.
Barger, G.
Barley, L. J.
Barlow, Sir H.
Barlow, W.
Bayley, H.
Béhal, A., *Past-President, Société Chimique de France.*
Belbin, C. N.
Belbin, T. St. J.
Benham, K. B.
Benton, W.
Berry, A. J.
Blackhurst, A. O.
Blackshaw, G. N.
Blackstock, G.
Bluman, N. J.
Borland, W. D.
Bowden, R. C.
Bragg, W. H.
Britton, R. P. L.
Brown, H. T.
Brown, L. N.
Brumfit, M.
Brunjes, T. A.
Buckle, E. A.
Buckton, E. J.
Bury, F. K.
Butterfield, W. J. A.
Cain, J. C., *Editor.*
Candy, H. C. H.
Carr, F. H.
Carr, S. E., *Assistant Secretary.*
Challis, O.
Chambers, P. H.
Chapman, A. C.
Chapman, A. J.
Christie, C. H. F., *Prime Warden, the Dyers' Company.*
Clark, J. G.
Clifford, F. W., *Librarian.*
Coates, J. E.
Cofman-Nicoresti, J.
Cohen, R. W.
Colgate, R. T.
Cooke, J. H.
Cooper, A. J. B.
Cooper, H. C.
Cooper, W. F.
Coote, C.
Coulthard, A.
Coutts, F. J. H.
Cribb, C. H.
Croft, C. M.
Crossley, A. W., *Foreign Secretary.*
Currie, W. L., *President, Pharmaceutical Society.*
Daily Telegraph, Editor.
Dale, H. H.
Dani, V. G.
Davis, E.
Dean, P. T.
Dhar, N. R.
Dhar, S. N.
Dobbie, Sir J. J., *President-Elect.*
Dobson, L.
Dorée, C.
Dreaper, W. P.
Dreyer, J. T.
Druce, J. G. F.
Dudley, H. W.
Durrans, T. H.
Durrant, R. G.
Dyer, B.
Eccles, W. H.
Edmed, F. G
Egerton, A. C. G.
Elliott, S.
Elliott, Sir T.
Ellis, C. S.
Ellison, H.

Elsden, A. V.
Evans, E. A.
Evans, E. V.
Evans, H. J.
Evans, J. H.
Evers, N.
Fargher, R. G.
Farmer, R. C.
Fenton, H. J. H., *Vice-President-Elect.*
Field, S.
Findlay, A.
Finnemore, H.
Fisher, H. A. L., *President, Board of Education.*
Forster, M. O., *Treasurer.*
Forwood, F.
Foulkes, C. H.
Fourneau, E., *Institut Pasteur.*
Fowler, A., *President, Royal Astronomical Society.*
Furse, Sir W. T.
Gamble, F. W.
Gardner, J. A.
Gardner, T. E.
Garland, C. S.
Geard, R.
George, S. E.
Gibson, C. S.
Gilbard, J. F. H.
Gilmor, D.
Ginner, W. P.
Girvan, A. F.
Glazebrook, Sir R. T., *Director, National Physical Laboratory.*
Goldsmith, J. N.
Goodson, J. A.
Gover, H. J.
Greenaway, A. J., *Sub-Editor.*
Greenwood, L. H.
Gregory, R. A., *Sub-Editor, "Nature."*
Griffiths, E. H.
Grist, W. R.
Haigh, T.
Haigh, W. D.
Hall, H. C. G.
Harden, A.
Hardy, W. B., *Secretary, Royal Society.*
Hartley, H. B.
Harvey, E. W.
Hattrick, J. M.
Hawkins, R. L.
Henry, T. A.
Hensley, E. H. E., *Master, The Grocers' Company.*
Hewitt, J. T.
Heycock, C. T.
Hickman, K. C. D.
Hicks, S., *Master, The Salters' Company.*
Higson, G. I.
Hill, A. C.
Hill, C. A.
Hinchley, J. W.
Hocking, F. D. M.
Hodsoll, C. W. P.
Hodsoll, H. E. P.
Holdich, Sir T. H., *President, Royal Geographical Society.*
Holdsworth, W. S.
Hooper, E. G.
Hooper, G. G.
Hope, E.
Horton, E.
Houghton, G., *Master, The Leathersellers' Company.*
Howard, A. L.
Howard, D. L., *Chairman, Fine Chemical Manufacturers' Association.*
Humphries, H. B. P.
Hutchinson, H. B.
Isherwood, P. C. C.
Jackson, Sir H., *President, Institute of Chemistry.*
Jarmay, Sir J. G.
Jays, M.
Jenkins, L. C. W.
Jones, S.
Joseph, A. F.
Jowett, H. A. D.
Kam, J.
Keane, C. A.
Keeble, F. W.
Keogh, Sir A.
King, H.
Kipping, F. S.
Kremers, A. T.
Lacell, H. G.
Laing, N. P.
Lamb, B. J.
Lambert, B.
Lamplugh, G. W., *President, Geological Society.*
Langdon, A.
Lapworth, A., *Vice-President.*
Laws, H. E.
Leadbetter, H. D.
Leather, J. W.
Le Beau, O. A.
Lees, C. H., *President, Physical Society.*
Lessing, R.
Le Sueur, H. R.
Levy, L. A.
Likiernik, E.
London, A. E.
London News Agency, Editor.
Lorenz, H. H. H.
Lorenz, H. R.
Lowry, T. M.
Lyons, H. G.
Macartney, Sir G.
McBain, J. W.

McKenzie, A.
Mackie, P. G.
M'Lennan, J. C.
Macnab, W.
Makins, Sir G. H., *President, Royal College of Surgeons.*
Martin, C. J.
Mascarenhas, J. C.
Mason, F. A.
Masson, J. I. O.
Matthews, D. J.
Matthews, F. E.
May, P.
Menzies, R. C.
Merton, T. R.
Messel, R.
Mills, W. H.
Mitchell, H. V.
Mond, Sir A., *First Commissioner of Works.*
Mond, E.
Mond, R. L.
Monier-Williams, G. W.
Moody, G. T.
Moon, P. G. G.
Moore, F. H.
Moore, N., *President, Royal College of Physicians.*
Morgan, G. T.
Morgan, H. H.
Morning Post, Editor.
Mouilpied, Capt. de.
Moulsdale, W. E.
Moulton, Lord, *Director-General of Explosives Supplies.*
Mundey, A. H.
Nagel, D. H.
Naylor, L. M.
Needham, T.
Nevile, S. O., *President, Institute of Brewing.*
Neville, H. A. D.
Newman, L. F.
Newton, L. O.
Nicholson, J. W.
Nierenstein, M.
O'Callaghan, J. P.
Oldham, H. Y.
Orton, K. J. P.
Page, H. J.
Pasfield, S. G.
Pearce, L. R. B.
Pearson, G. E.
Peet, F. F.
Perkin, F. M.
Perkin, W. H., *Past-President.*
Perry, G. H.
Philip, J. C., *Secretary.*
Pickard, R. H.
Pilley, J.
Pizey, J. H.
Plimmer, R. H. A.
Pope, Sir W. J., *President.*
Poulenc, C., *President, Société Chimique de France.*
Prain, Sir D., *President, Linnean Society.*
Press Association, Editor.
Prestige, Major.
Price, Sir K.
Price, T. S.
Pugh, R. J.
Pyman, F. L.
Rée, A.
Renwick, F. F.
Rideal, E.
Rideal, S., *President, Society of Public Analysts.*
Rintoul, W.
Robertson, Sir R.
Robins, A. E.
Robins, H. H.
Rolleston, Sir H., *President, Royal Society of Medicine.*
Ross, H. M.
Rotter, G.
Russell, A. S.
Russell, J. D.
Sage, C. E.
Sanders, P. R.
Sanderson, J.
Savile, W. C.
Scott, A.
Scott, Alex., *Past-President.*
Seligman, R.
Shannon, W. V.
Shaw, H. G.
Sidgwick, N. V.
Simmons, W. H.
Singer, H.
Singer, N.
Slade, R. E.
Smiles, S., *Secretary.*
Smith, G. F. H.
Smith, T.
Smithells, A., *Vice-President.*
Sommerville, D.
Spencer, E. S.
Spencer, E. W. St. G.
Speyer, F. C. O.
Spielmann, P. E.
Stevenson, H. E.
Stubbs, G.
Sutton, F. C.
Sutton, F. N.
Talbot, H.
Tallantyre, S. B.
Tangye, A. W.
Taylor, G.
Taylor, G. I.
Thomson, Sir J. J., *President, Royal Society.*
Thorne, L. T.
Thorpe, J. F.
Thuillier, H. F.
Tilden, Sir W. A., *Past-President.*

Times, Editor.
Tinkler, C. K.
Tripp, E. H.
Tucker, T.
Turner, W. E. S.
Vining, D. C.
Voelcker, J. A.
Wagner, W. G.
Walmsley, A. E.
Walpole, G. S.
Watts, J. I.
Webb, Sir A., *President, Royal Academy.*
Westrup, G. V.
Whalley, H. C. S. de.
Whalley, L. J. de.
Widdicombe, J. H.
Williams, C.
Withers, J. C.
Wood, F. C.
Woods, G. J.
Wright, A.
Wright, A. M.
Wynne, W. P., *Past-President.*
Youll, J. W. R.

The following toasts were proposed:

By The President:

1. "His Most Gracious Majesty the King."

2. "Their Majesties the Queen and Queen Alexandra, His Royal Highness the Prince of Wales, and other Members of the Royal Family."

By the Right Honourable Lord Moulton, G.B.E., K.C.B., F.R.S., *Director-General of Explosives Supplies in the Ministry of Munitions.*

3. "The Chemical Society," coupled with the name of *The President.*

By Professor H. E. Armstrong, LL.D., F.R.S., *Past-President of the Chemical Society.*

4. "Our French Colleagues," coupled with the name of Dr. C. Poulenc, *Président de la Société Chimique de France.*

By Sir James J. Dobbie, M.A., D.Sc., F.R.S., *President-Elect of the Chemical Society.*

5. "The Guests," coupled with the names of The Right Honourable Herbert A. L. Fisher, *President of the Board of Education*; Sir Aston Webb, K.C.V.O., C.B., R.A., *President of the Royal Academy of Arts*, and Sir Joseph J. Thomson, O.M., D.Sc., F.R.S., *President of the Royal Society.*

The Loyal Toasts having been honoured,

The Right Hon. Lord Moulton, in proposing "The Chemical Society," said: "It is given to me to propose the health of the Chemical Society and of Chemical Science. I can assure you that I feel highly honoured in being chosen to perform so grateful a

duty, all the more because I am able to speak from my experience of chemical science and of this Society, and I am glad of an opportunity of expressing my gratitude. At the last dinner of your Society a very distinguished literary man, in reply to the toast of 'The Guests,' spoke of the wondrous work of chemistry, and uttered the momentous words that 'chemists, if they have not succeeded in making war impossible, have at least succeeded in making it preposterous.' I think that probably these words as correctly express the conditions in 1913 as any other words that could have been chosen. We know at least that the chemists have not succeeded in making war impossible, but if the word means something utterly repugnant to the feelings of every healthy-minded man, they certainly have succeeded in making war preposterous. A very short time after that occasion we find ourselves at war with great and powerful nations, our real enemy being the nation that had devoted itself *par excellence* to chemistry. Few people, I think, realised the extent to which this war was based on chemists and chemical progress. There is not the slightest doubt that the dogs of war were held in leash until the completion of those great installations which produced ammonia by the Haber process. Germany was wise enough to realise that she must be cut off from her nitrates unless she could produce at home ammonia in the vast quantities required for the nitric acid for explosives, and she waited until the magnificent installations were completed by which she could attain this end. That was not all. The Germans knew that this war would be a war on an enormous scale, utterly deceived as they were as to the length of time during which it would last, and they looked to the large chemical installations for the manufacture of dyes and other chemical products to be their source of the munitions necessary to carry on the war. Finally—for I believe that from the first they had prepared themselves to violate The Hague Convention—they looked to the production of the devilish poison gases which they ultimately poured against our troops. These were the things which, coupled no doubt with the great advance they had made in artillery, emboldened them to think that they had but to strike a blow and supremacy over the world was theirs, so that it really was a war in which each nation depended on its chemists. It depended on its chemists entirely for its propellants, entirely for its high explosives, and entirely for its poisonous gases. Now who was it Germany attacked? I am not speaking of France. France was nearly as poorly prepared as we were, in spite of the number of her soldiers; but Germany was attacking us, and I ask you for a moment to listen while I contrast the state of that country in chemistry with

the state of England. We had no means of making ammonia beyond the amount that we obtained in the ordinary by-products of gas in the coke ovens, and we had no means whatever of turning that into nitric acid, and the consequence was we were entirely destitute of any home source of nitric acid or nitrates. That is not all. Germany had gigantic chemical factories with standardised plant, which they could turn from their peaceful manufacturing to the production of munitions of war. Alas! as I learned to my cost when I first took up the supply of explosives in November, 1914, England was practically destitute of factories which could be turned to warlike purposes. England was possessed of no plant from which poisonous gases could at once be made, and no experience, no knowledge of how to use them, because, I am happy to say, it had never occurred to her that such a gross breach of faith and such a violation of humanity would take place, even with a war with Germany. Now that represented the position of the two combatants at the moment when war was declared, and, gentlemen, you who are proud of your profession as chemists might ask yourselves on what body of people in England did the safety of England most depend, and I think you would be justified in saying that it was the chemists of England who had to resist Germany. Realising as I did at that time, and as I do now, the condition of the chemical industries in England at the moment, I think it is marvellous that, when that challenge came from the nation pre-eminent in chemistry to a nation that was almost notorious for the extent to which it had neglected the industry of organic chemistry, the English chemists so responded that by the time the war was at its height, and still more at the time when the war came to its conclusion, they were not behind their foes in anything in chemistry. They were equal to them in all the legitimate branches of explosives, and they had nothing to fear in comparison in the field of poisonous gases. I think we can say that from end to end of the line of munitions, and from end to end of the line of chemical employment in warfare we stood at least their equals, if not their superiors. Now, I have heard doleful things said about English chemists. I think doleful things ought to be said against English industries—that they have availed themselves so slightly of the mass of chemical talent that there is in this country. I know that I never appealed in vain for aid in the very arduous task we had of creating enormous chemical industries to supply the ammunitions that modern artillery requires, and I always found enough able men to carry out any plan that I was prepared myself to embark upon. That is a very great triumph, and it shows, I think, that in any war in which we did not allow our-

selves once more to be surprised, we should have no reason to fear the superiority of any foe. After all, war is not the object of life. We have to think of peace first, although we must in future have a peace which does not leave us defenceless in war. We must realise that a nation must set before its eyes the obligation of being so far self-contained that it cannot be cut off from its essential means of defence, which are the only protection of its liberties, against invasion or against an ambitious foe. I think that this lesson, that the nation must be self-contained, has had a great deal of light poured upon it by what occurred during this war. We found ourselves again and again at the limits of our resources in various things essential to the manufacture of our munitions, and in this emergency we generally found that there was some way of overcoming the difficulties by starting from some other raw material or by adopting some other process, and this war has been a great lesson in teaching us that if it comes to the pinch we can vary our modes of production so as to use new raw material, manufacture by different processes, or even employ new substitutes. I remember a time when it looked as if acetone would fail us, and that we could not do without it. Instantly two methods were started, by one of which we did without it grudgingly, and by the other we proposed to make it by a laboured method not thought to be of any practical use before, because it was so complicated that it would have been commercially unable to exist.

"Germany and England both learned that if put to the test the resources of the country are much wider than they are thought to be, because the elements of all that is necessary exist almost in every country, and what with the triumphs of chemistry and the triumphs of physics, so long as the elements are there you can as you will make any compound you need. So we have learned much in relying upon ourselves. Now we turn to peace. How much of that will be left? If we are wise, peace will always continue its work with an eye to the possibility of the strain of war, and to do that will be a triumph of chemical science and ingenuity which will make the world far richer. You know that the engineers in their charter defined engineering as the art of directing the great sources of power in nature to use them to the convenience of man. Engineers are not the only ones who are entitled to use these sonorous words. The whole of the great source of power, chemical affinity, is in your hands, and it is for you to show that you are equally efficient in directing this to be used for the convenience of man. In this connexion, it seems to me that the prospects before the eyes of chemists are limitless. Chemistry has

been drawn nearer and nearer to her sister, Physics. When you consider the Haber process, you wonder whether you ought to call it a physical one, because it depends on pressing together the combining gases, or whether you ought to call it a chemical one, because that pressure would be useless were it not for the mysterious effect of the catalyst you use, and with Chemistry and Physics working hand in hand the triumphs which may be won are unlimited. New substances with strange qualities rendering them useful, but unsuspected before, the shortening of processes, economy, the absence of waste—all these are equivalent to giving to mankind that which it requires, at least within the labour cost of old, and the whole realm of this lies in your hands. From most unexpected quarters these discoveries come. That is why I feel such special pleasure in proposing prosperity to the Chemical Society. Anyone who works blindly for utility is apt to get into a *cul-de-sac* from which he cannot escape. The right thing is to work for knowledge, and then with knowledge you can choose with certainty the path that leads to any desired useful result. Although you work in chemistry for knowledge, yet the reward of knowledge is public utility, a reward you may work for directly, but will not if you are wise, excepting in industrial spheres, but which, after all, is the crown of the work of chemistry and of every man of science who is dealing with practical subjects. Therefore it is that I admire the Chemical Society, because it puts forward as its aim research, the questioning of nature as to how it will behave in new circumstances, the recording of the answers, and the study of the lessons that they teach in order that it may thoroughly understand that with which it is dealing whenever it is called upon to come to the help of mankind. With this toast I have to propose the health of your President, Sir William Pope. Throughout the War, whenever a problem presented itself requiring wide chemical knowledge, keen chemical insight, and almost prophetic power, one appealed to Sir William Pope. It was not only in the simpler problems of explosives, but in the infinitely difficult chemical problems which dealt with poisonous gases, that he gave us such successful and valuable help. That would be enough to ensure that his fame went down as an eminent assistant to the nation in its time of trial. But peaceful habits led him into other fields, and I cannot but speak with the deepest gratitude of the assistance he gave in the comparatively polite realm of photography, where he enabled those gallant men who went up in our aeroplanes to register by the camera all the details of the enemy's positions at times when they could not have done it with the eye, although with the selective plates which he produced they succeeded in getting the most

accurate records. In his earlier work in chemistry your President had the most peaceful tastes, not even utilitarian. I remember when I first got acquainted with his work he was finding out how in the extremely quiet and domestic circle of crystals the various molecules sat round the table. He discovered this, and left it to be proved by other methods of investigation. He accomplished a work which will make his name honoured even if he had not taken up the war cause. Now, from the beginning of his career to the end he has always worked with an eye to knowledge. He is your real representative as one who reveres research, and the fact that what he has done has been so useful must not be looked upon as a reproach to him. Now, gentlemen, I ask you all—you are all interested in chemical science in the Chemical Society, and I am sure you are all interested in its President—I ask you now, just after chemistry has won a war in which it was challenged by the great chemical nation and, accepting the challenge, beat it—I ask you with all due enthusiasm to drink to the toast, coupling it with the name of your President, Sir William Pope."

Sir WILLIAM POPE, in response, said: "In common with everyone present I have listened with the most intense interest to what Lord Moulton has said in proposing this toast of the Chemical Society which you have received with so much enthusiasm. The Chemical Society is an institution of which we are all justly proud. It is the oldest chemical society in the world It is now nearly eighty years of age, and it numbers some 3,500 members. But the age of the Chemical Society is not the age of decrepitude, and whilst in the past the constitution and procedure of our Society has served as a model of everything that has been done by sister societies, I think we may justly claim that the Chemical Society is still in the van, prepared to produce new methods for stimulating scientific work and scientific effort. I need not remind you of a number of things that have emanated during late years from the Chemical Society. In that connexion, for instance, there is the publication relating to the progress of chemical science which we instituted some fifteen years ago, and has now been imitated during the last two or three years only by our sister society, the Society of Chemical Industry. The toast of the Chemical Society has been entrusted very appropriately, I think, to the greatest chemical manufacturer of this or any other day. During the last four years Lord Moulton has undertaken the task of building up a huge chemical production, one which surpasses anything that has been undertaken or achieved in the past, and has resulted in the production for our country of ample supplies of propellants, high explosives, and noxious gases. Consequently, we have been

able to hand over to the middlemen, our military and naval friends, the materials which it has been their duty ultimately to deliver to the final consumer, the enemy. It is a very great pleasure to see here this evening so many distinguished representatives of His Majesty's Forces, and to note that, to this extent at any rate, they recognise us as brothers. I can assure them that I am perfectly certain that in extending greetings to them I am speaking in the name of all the Fellows of the Chemical Society. We all feel that it is one of the greatest privileges that could be given to any Fellow of this Society to be allowed to contribute in some small part to assisting the efforts of our gallant troops in the field. We as chemists have been honoured by being made an essential part of the stupendous weapon for destruction which our country has forged, in the forging of which Lord Moulton has played so great a *rôle* and in the application of which our forces abroad have had the executive part. The question cannot fail to force itself upon us, however, as to what is going to happen in the future. We have seen that in the stress of a great modern war it has proved necessary to utilise all the resources of modern science, and those resources have been utilised without scrutiny of cost, without care as to the amount of money or quantity of material which has been expended, and I venture to think the result has been worth the expenditure. The future, I think, will prove that we must utilise precisely the same methods in the great struggle which is in front of us. Unless our country can see its way to utilise every effort of science, to do everything it possibly can to promote the development, not only of applied, but of pure science, then our country will fall behind and we shall no longer occupy the position that we do, thanks to all that has been done during the last five years. In other countries, in America, in France, and in Germany, we may take it that no relaxation will occur in the strenuous exertions which have been put forward during the time of war for the utilisation of every sphere of scientific activity for purposes of national effort; in the future, as in the past, we shall have to strain every nerve in order to retain the position we have gained during the last few years. It lies with our leaders to determine to what extent science is to be allowed to participate and to assist in the coming great wave of intellectual and material progress throughout the world. If science is now going to lapse into the position of neglect which it occupied previous to the war, we may take it that in this great advance our country will be left in the backwash of human progress. The first thing that is needed and is essential in stimulating the national feeling with regard

to science is that the nation should be prepared to pour out treasure into our educational establishments for the purpose of securing as large an amount of the potential young energy of the country and of directing it into scientific channels, and, secondly, it is absolutely necessary that money should be poured into our universities for the purpose of stimulating scientific research and of securing an adequate output of scientific knowledge. Whether it is pure knowledge, which is often supposed to be useless, or whether it is applied knowledge, which has a money value, or not, appears to me a matter of absolute indifference. The dividend which will be paid will in either case be enormous. The great object which we have to achieve, and can only be achieved by the expenditure of large sums of money, is the increase of human knowledge, and all increase of human knowledge is scientific. Lord Moulton has been pleased to refer, with some rubbing of the hands, to the manner in which he seduced me from the paths of pure science to those material problems which he took up some four or five years ago. I plead guilty to the charge. No one could fail to be seduced by Lord Moulton's persuasive way, and the mere fact that an academic chemist can turn immediately on to these highly technical problems indicates clearly the truth of what I have just said—that no essential distinction can be drawn between pure science and applied science. I am only one amongst the many hundreds of chemists in the country—Fellows of this Society—who have been honoured by being allowed to do their best in this great struggle in which our country has been engaged, and we can all congratulate ourselves that we have had such a leader as Lord Moulton to take in hand this enormous task and to bring it to such a brilliant conclusion. Gentlemen, on behalf of the Chemical Society I thank you very heartily for the way in which you have received this toast, and I am perfectly sure that we shall all carry away this evening a very vivid recollection of the extremely interesting manner in which Lord Moulton has proposed it."

Prof. H. E. Armstrong: "The toast which I am privileged to submit for your acceptance is that of 'Our French Colleagues.'

"Almost immediately after Faraday's death, in 1867, the Chemical Society considered how it might best perpetuate the memory of the great experimental philosopher who had done so much for chemistry—by establishing the laws of electrochemical change; by his discovery of benzene, the foundation stone of the dyestuff industry; and by his work on the liquefaction of gases—all subjects which have been greatly developed in the interval. The result was that the Faraday lectureship was established. Those first considered as

possible lecturers were Dumas, Liebig and De La Rive. The choice fell on the distinguished French philosophical chemist, noted as the parent of the substitution theory, which at first was scoffed at in Germany. Dumas delivered his lecture—a masterly discourse—all but fifty years ago, in June, 1869.

"In 1891, on the occasion of the Jubilee of the Chemical Society, we were favoured by the presence of a deputation from our sister Society in Paris—the President, M. Gautier, MM. de Clermont, Combes and Haller. In 1908 we returned the compliment, when the French Society celebrated its Jubilee. Sir William Ramsay, Sir William Perkin, Dr. Horace Brown and I were your representatives.

"These are the only two occasions on which there has been an official exchange of courtesies between the two Societies.

"To-day, for the first time, the French Society is officially represented at our Anniversary meeting, by our special invitation. Fellows will agree with me, I am sure, if I express the hope that the beginning made to-day will be the regular practice of the future. The visit occurs at the close of a cruel and colossal struggle in which the two nations have co-operated with absolute unanimity of purpose, whole-heartedly, in the interests of civilisation and humanity. Let us hope that such co-operation will long continue between France and England; that we may learn to know one another more and more intimately as years roll by and, as a consequence, become more and more intimately associated in the progress of the world.

"It has been said—said with truth—'La Chimie est une science française, elle fut constitué par Lavoisier, d'immortelle mémoire.'

"Lavoisier undoubtedly made chemistry a science—he gave it a philosophy which is preserved to the present day. We talk his language and live on the air to which he gave a vital name, as far back as 1778, in calling it 'oxygen'—the most descriptive and significant term ever applied to any substance and, *pace* Arrhenius and others, the one and only name of truly foundational meaning that can be applied to it. His proposal to call nitrogen 'aminogen' is further proof of his perspicacity; his wonderful prescience was also displayed in calling organic chemistry the chemistry of compound radicles.

"But many of the primary members of the great philosophical framework of chemistry, since built up on the foundation so perfectly laid by Lavoisier, are the work of French hands almost too numerous to mention—Gay Lussac, Dulong and Petit, Berthollet, Regnault, Biot, Dumas, Laurent and Gerhardt, Chevreul, Wurtz, Berthelot, Pasteur, St. Clair Deville, Friedel, Moissan—all immortal names. These were all actors in the atomic drama—

denizens of what may be called the Daltonian epoch, now passing away. But the staging of the new drama—the infra-atomic drama —which is taking the place of Dalton's was also begun in France, this time with the aid of a woman, by Mons. and Madame Curie, by the recent discovery of radium.

"The French are marked out as a people with ideas, schooled in rhetoric and gifted with the faculty of giving clear expression to their ideas. Mathew Arnold has told us that we are Philistines, a people devoid of ideas. This is not altogether true but it is certain that we might use ideas far more freely than we do; that it will do us good to bring ourselves more under the influence of those who are idealists.

"I ask you to drink enthusiastically to our French colleagues in science and have the honour to couple the toast with the name of the President of La Société Chimique de France, M. Poulenc, who himself illustrates the tendency of the age to couple practice with science, as he is a manufacturer. M. Béhal, his senior colleague, is well known to you by name; we had the pleasure of welcoming him here on that remarkable occasion, the British Association meeting at Oxford, when we first heard of argon. Prof. Fourneau has the distinction of being the inventor of the first synthetic lumbar anæsthetic—Stovaine, a name which embodies a felicitous play upon words in two languages and therefore a proof that a happy combined use may be made of French and English."

M. Poulenc, in reply, said: "Permettez-moi de remercier tout d'abord Monsieur le Professeur Armstrong des paroles très aimables qu'il a bien voulu m'adresser ainsi qu'à mes collègues, le Professeur Béhal et le Professeur Fourneau.

"Nous savions déjà par le ton si cordial de l'invitation qui nous a été faite par votre Président au nom de votre Société l'accueil qui nous était réservé, aussi laissez-moi vous dire combien mes collègues et moi en sommes profondément touchés et combien nous vous en remercions de tout cœur.

"En pénétrant tout à l'heure dans cette salle, ma pensée s'est reportée instinctivement au dernier banquet de la Société Chimique de France que j'ai eu l'honneur de présider à Paris le 30 Mai, 1914. Deux mois nous séparaient à peine de la déclaration de guerre. J'avais à mes côtés notre conférencier d'alors, le Professeur Willstätter, qui venait de nous exposer ses remarquables travaux sur la composition de la chlorophylle et des matières colorantes des fleurs, et Sir William Ramsay, votre illustre compatriote.

"Près de cinq années se sont écoulées. Le professeur Willstätter, signataire du manifeste des 93 intellectuels allemands, s'est couvert à jamais d'une flétrissure que rien ne saurait effacer, Sir William

Ramsay, dont je salue ici avec respect et non sans émotion la mémoire vénérée, est entré dans l'Immortalité, laissant à son pays un des noms les plus grands dans la Science.

"Près de cinq années se sont écoulées et nos deux peuples unis dans un même idéal ont mêlé leur sang sur les champs de bataille et fait triompher la cause sacrée du droit, de la justice et de la liberté.

"Près de cinq années se sont écoulées et c'est encore comme président de la Société Chimique de France que j'assiste à ce banquet. La guerre aura fait de moi et malgré moi un des plus vieux présidents de notre Société. J'aurais tort de m'en plaindre, puisque c'est à cette circonstance que je dois le très grand honneur d'avoir été le premier président de la Société Chimique de France qui ait été invité officiellement à prendre part à l'une de vos réunions annuelles et je ne saurais trop vous remercier de cette délicate attention.

"Notre Société ne s'est d'ailleurs pas méprise sur la signification de cette invitation, qui marque en traits indélébiles le chemin parcouru par nos deux nations pendant ces cinq années. A l'estime et à la sympathie que nous éprouvions les uns pour les autres a succédé un sentiment à la fois plus fort et plus doux; il semble qu'il se soit établi désormais entre nous comme un lien de parenté. Et cela est si vrai, qu'à la première manifestation publique de votre Société vous avez désiré que nous fussions à vos côtés pour partager la joie que vous éprouviez à vous retrouver réunis après une si longue absence.

"Laissez-moi vous dire que ces dispositions correspondent en tous points aux sentiments qui nous animent et que nos cœurs vibrent à l'unisson des vôtres. Cette union fera notre force et nous est d'autant plus nécessaire que, si mettant en commun les ressources de nos connaissances techniques, nous avons pu pendant cette guerre mener le bon combat contre l'Allemagne, nous ne devons pas oublier que notre tâche est loin d'être terminée.

"Sans doute nos industries chimiques ont fait de grands progrès durant cette guerre et je doute que les Allemands qui ont tout prévu aient envisagé cette conséquence, mais il serait dangereux de s'illusionner sur le chemin qu'il nous reste à parcourir, la guerre n'est pas encore gagnée sur le terrain chimique. Seule, la conjonction de nos efforts, tant dans le domaine des recherches de science pure que dans celui des réalisations industrielles, peut nous permettre de nous affranchir définitivement de l'emprise allemande.

"C'est pourquoi, Messieurs, je lève mon verre à l'union toujours plus étroite entre nos deux Sociétés pour la grandeur de la Science et la prospérité de l'Industrie Chimique dans nos deux grands pays."

The CHAIRMAN: "In our desire to effect economy of time this evening, we omitted a toast which deserves to follow directly after the Royal toasts at any British dinner-party. It is that of our Naval and Military Forces. I ask you now to drink the health of His Majesty's Forces, coupled with the name of Sir William Furse, Master of the Ordnance."

Lt.-Gen. Sir WILLIAM FURSE: "I had no idea when I came here to-night as the honoured guest of a very distinguished member of your Society, who himself has directly done great things for the British Empire during the last four years, that I was to be called upon and honoured by being asked to return thanks for the profession to which I am quite sure you will understand I am most proud to belong. Your President in his earlier address said most kind things about the Army, and I noted with the greatest pleasure that he spoke of the way in which his profession—your profession and ours—had been joined together in this common work for our beloved country during the last four years. I am perfectly certain that the greatest asset to this country of this horrible war we have fought out through four and a-half long years to complete victory has been the joining together of the Services of all kinds, Civil, Naval and Military, in this country. England has always realised that its whole existence depends on the Navy keeping the seas, and we all know how nobly that Service has made good during the last four and a-half years. If I may say so, I do not think that our country has realised before this war that service in the Army is or may be a necessary part of the duty of citizenship, whether you are a professional soldier or professional chemist. Your President has alluded to this bond between the soldier and the chemist, and has spoken of the necessity of keeping touch between these two Services in the years of peace, which we hope will continue for a long time, from now on if we are to be prepared for the possibility of another war coming upon us. He spoke, and Lord Moulton spoke earlier, of the way in which our enemy had started this war on what Lord Moulton called a chemical basis, and how they expected to win the war by chemistry. Lord Moulton further pointed to the absolute unpreparedness of this country in so far as its chemical knowledge could be applied to the needs of war. That 'contemptible little army' that set out from here in August, 1914, and its followers drawn from every profession in this country, were able, thank God, to hold the line until the Chemical Society, headed by Lord Moulton, was able to produce what we required to defeat the enemy on their own lines. I will not sit down without telling you from the bottom of my heart—and I am sure every man in uniform here,

and those who I am sure have been in uniform, have now been demobilised, and are in 'civvies,' will agree with me—that we owe and know that we owe, and are proud to know that we owe, to the Chemical Society our deep, heartfelt thanks for the magnificent, untiring, and efficient way in which it has helped us to win this war."

Sir JAMES J. DOBBIE, in proposing the toast of "The Guests," said: "We are honoured by the presence of many distinguished guests this evening, to all of whom we bid a hearty welcome. We have amongst us members of His Majesty's Government who have snatched time from their public duties to be with us, showing by their presence the interest they take in and the importance they attach to our Society and to chemistry. We have also with us members of His Majesty's Forces, to whose gallantry and devotion to duty we owe it that we are able to sit here to-night in peace and security; representatives of the universities, of the principal scientific societies of the metropolis, masters and wardens of the great City companies, to whose munificence science in this country is so deeply indebted; representatives of Literature and of Art, and I must once more mention the distinguished visitors from our gallant ally, France, whose presence on this occasion affords us peculiar pleasure and gratification. I confess that I was puzzled when I received the list of guests to know by what synthetical process I was expected to bring them all into one point of view and within the compass of a single toast. But on studying the list more attentively I observed that although the interests our guests represent are so numerous and so varied, the chemist has been closely associated with all of them during the period of the war. That, then, is the point of touch with nearly all our guests to-night. The war has forced upon the country a closer association between the man of science and the man who applies science than has ever been seen before, and that association has been accompanied by the happiest results. After what has fallen from Lord Moulton and from the gallant gentleman who has just spoken, we need not hesitate to claim that it has contributed in no inconsiderable degree to the great victory that we have achieved. And, now that the War is over, may we not hope that the co-operation between the chemist and the various interests represented here to-night may continue and prove no less efficacious in promoting the arts of peace and in building up again the prosperity of the country? I associate with this toast the name of Mr. FISHER, who has earned the gratitude of his country by the great services he has rendered to education during the time he has been in office at the Ministry of Education. He has won the confidence of scientific men by the patience and insight which he has brought to bear

on the study of the questions in which they are more specially interested. And, if I may say so without presumption, he has shown his grasp of the requirements of science in nothing more conspicuously than by his advocacy of the view that the ample endowment of the scientific departments of our universities and great technical schools is the surest way to promote the best interests of research and the higher branches of scientific knowledge. I also couple with the toast the name of the President of the Royal Academy of Arts. Sir ASTON WEBB represents a branch of art which touches us all closely. With an architect of his eminence occupying the position of influence which the Chair of the Academy confers on its holder, our hopes run high for the future amenity of our great cities. But it is not merely with feelings of expectation of favours to come that we welcome him—we do not forget that Science owes to him some of the stateliest buildings she possesses in the metropolis. I also couple with the toast the name of Sir JOSEPH THOMSON, who is really one of ourselves. If not, at any rate he dwells in the debatable land between physics and chemistry, and is inspired with the genius and speaks the language of both sciences. Chemists and physicists unite in paying homage to one whose great achievements have rendered the opening years of the present century no less illustrious in the annals of science than the opening years of last century.

The Right Hon. HERBERT A. L. FISHER, President of the Board of Education, first replied. He said: "I regard it as a great compliment to have been invited to this historic gathering of the Chemical Society at the conclusion of one of the greatest victories which chemistry has ever won in the history of mankind. I feel, indeed, that I am a profane intruder into a magic circle. You, gentlemen, are all of you magicians, past-masters in the fine art of murder. I am merely a melancholy product of the dark ages of compulsory Greek. It is true that I have forgotten a little chemistry and a little physics, and I feel as I read the biographies of the great heroes of science how much I have lost by the early limitations of my interest and of my education. In this I am not a solitary sufferer. Nevertheless, if we turn over the pages of Huxley's Addresses on the place of science in national education —and there are few finer specimens of virile English prose—I think we shall feel that if that great master were among us here he would acknowledge that the cause to which he dedicated his life has been practically won. It is perfectly true that we have still arrears to make up. We have been reminded of them to-night. We have been reminded of them by a recent Government report. We want more money for science—we want a great deal more money for science; we want more teachers; we want more learners;

but, in the main, the battle is won. If there are any sceptics to-day, they must surely have been converted by the achievements of science in the war. Gentlemen, the whole world trembles before your formidable powers. You have made war improbable, and if war is to be a thing of the past, chemistry will be the principal agent of that beneficent change. You will, I believe, have done more than any League of Nations can possibly aspire to do. I trust, indeed, that in the times to come you may find it possible to divert your brilliant and ingenious labours into other fields. You have made yourselves a great name in the world through the invention of substitutes; can you not invent a substitute for industrial unrest? Can you not invent a substitute for Parliamentary oratory, or rather, let us say, for the post-prandial oratory of Parliamentarians? If so, you will certainly have earned my lively gratitude. Professor Armstrong reminded us, very happily, I think, of the fact that modern chemical science owes its origin to the brilliant labours of Lavoisier. May I add that the first statesman who realised the force which chemical science could contribute to a modern State was Napoleon. One of Napoleon's first acts on raising himself to supreme power in France was to appoint an illustrious chemist as Minister of Interior. Honesty compels me to confess to you that the appointment was a failure. Nevertheless, I think that from that time forward there has been a consensus of opinion in progressive States that national power is at any rate to some extent dependent upon the labours of chemists. Now we realise it more fully than ever before. We realise, I hope, that the best form of protection for national industry is not more tariff, but more chemistry. Chemistry enables us to develop, as Lord Moulton has pointed out, industries previously undreamt of, to employ substances previously not utilised, to turn to account all the slag and waste of material production. I stand here as a representative of public education, and I have sometimes asked myself whether the large sums of money which I trust the nation will henceforth be prepared to spend upon the public education of the whole populace will redound to the increase of science amongst us. Sceptics have often said to me: 'You are pouring out money upon the education of minds so narrow, so circumscribed, with so little power of imagination in them, so little able to respond to genuine intellectual stimulus, that you might as well be pouring your money into the sea.' I do not believe in that doctrine. I believe that unless we are prepared to provide the country with a large and generous scheme of public education we shall lose the benefit of a number of talents which, with a little encouragement, might be educated to a high pitch of accomplishment. I believe, further, that it is necessary to create in the whole country a general atmo-

sphere of mind favourable to scientific ideas. I believe that unless you can spread throughout the whole of the community a kind of feeling, perhaps it may be an uneducated feeling, but at any rate a kind of feeling that science has its message, has its value, and ought to be encouraged, and that no money spent upon science is money wasted, you will never have your science in a thoroughly satisfactory and wholesome condition. And so I surmise that thirty years hence, when the educational changes which have recently been introduced have had time to bear their full fruit, my successor at the Board of Education standing here as the guest of the Chemical Society will have no reason to complain of the neglect of science."

Sir Aston Webb said: "On behalf of the Royal Academy, which I have the honour of representing to-night, I thank you very much for including us in this toast. I do not mind confessing to you that I feel like a fly in amber, you, the Chemical Society, being the golden amber and myself the fly. At the same time I would like to say that there is a closer connexion between science and art than perhaps might appear on the surface. Your President has told us that the Chemical Society is, I think, eighty years old. The Royal Academy is 150 years old. I am not going to take any credit for that. I remember a very distinguished person whose club asked him to dinner to celebrate his fiftieth birthday, and he replied that he declined the invitation because he did not consider the fact of his being fifty years old a matter of congratulation at all. So I think mere age is perhaps in some ways a disadvantage, especially unless we are able to take advantage of it and improve and alter ourselves as we grow older.

"The one quality art looks to science for is permanence. No matter how fine a picture, or beautiful a building, without the quality of permanence it is a failure, and it is to chemistry we look for the permanence in our work, which we cannot guarantee for ourselves. The use of colour in pictures is greatly a matter of chemistry, and in many cases where the proper use of colours has been neglected the pictures are now wrecks. On the other hand, there was a great picture in Christ's Hospital of Charles II., which after 250 years was found to be as perfectly sound as when it was painted. The same thing may be said in regard to architecture. Nothing is more important than the chemistry of our building materials, and I only wish some of you gentlemen would take up that question seriously and advise us on the qualities of many of the materials which I am afraid we use without the scientific knowledge of their component parts which we ought to have. Reference has been made to the great housing schemes which are now coming, and I thank you for referring to the Royal Academy as doing something

for the amenities of our towns. That, I think, is one of the great things that artists should do to influence the amenities and beauties of our towns. We are about to have immense housing schemes in every district, and one of the materials suggested is concrete composed largely of Portland cement. I do not know whether chemists know all about Portland cement, when and why it contracts, and how to stop the movements of this material which we use to a great extent. We should like to know.

"In another way we are close neighbours. Our building is at the end of a court, whilst your building has the advantage of a frontage to Piccadilly. I was articled to the architect who built that building, and I went over the building works from time to time, little thinking that later on I should have the honour of presiding at the big house at the end of the court. As I walk up that quadrangle I often wonder whether the thought and imagination going on in these buildings do not have as great an influence on the world as the achievements of those who carry on the works that are first thought of there. I have heard it said that England has not a great appreciation of imagination. We are apt to say 'It is a pure matter of imagination' as though it was a rather contemptuous thing. But surely imagination is the great quality, the God-given quality that produces, and it is that quality that you and I and all of us must have if we are to do something for mankind, for imagination can produce that which nothing else can do."

Sir Joseph J. Thomson said: "I should be guilty of a 'terminological inexactitude' if I said it gave me great pleasure to reply to this toast, but it certainly gave me great pleasure to accept the invitation to this dinner, because I recognised in that invitation an indication that science is returning, at any rate to some extent, to its old course before the war. We hear nowadays much said about the characteristics of English science as compared, say, with that of Germany, but I think one of the characteristics of English science has always been conviviality, and the dinners that have been associated with the various societies form a not unimportant aspect of science in this country. These have been necessarily suspended, so that although I have been President of a Society for three and a-half years this is the first occasion on which I have risen to respond to the toast of science. It shows that war with all its horrors is not without its minor alleviations. I think that English science can look back with confidence on its record in the war. Men of science have uniformly devoted themselves since this terrible war began to doing what they could to strengthen the forces of our country. They have given their time, and in not a few cases they have given their lives. It has given to us who are academic a somewhat exhilarating

experience. We have always been doing something that we have not been accustomed to. We have been turned on to problems to deal with which we felt our qualifications in some cases were of the slightest, but the principle we have gone on has been that when we were asked to do a thing we tried to do it. It was not ours to reason why. We have learned a great deal by our experience in this war, and not the least of the things we have learned has been sympathy with the difficulties of those who are engaged in the application of science to industry. In our laboratories we are satisfied that we have finished a problem, so to speak, from a scientific point of view, when we have got to the root of the fact we are examining. In reality that is only the first step, and perhaps a comparatively small step, in what we have to do. It is very much as if a man had merely reported to a superior officer. The facts have now to be applied to industry. The scientific problem is to most of us a delight, but then you have to persuade boards that a certain course is the right one to take. You have to persuade manufacturers to deliver what you want in reasonable time and to find men who will not play havoc with your appliances, and then it is that your real difficulties and worries begin, and I would like to say that we have now in this country men who are accustomed to this kind of conflict that upsets everyone who attempts to apply science to practical purposes. We have men of great ability acquainted with Service conditions and the limitations that these conditions impose, and it will be a great misfortune if the services of these men are scrapped. I have a feeling of goodwill towards the League of Nations, but I think we want something behind that. I think this country ought at any rate to have the potentiality of defending itself if the League of Nations does not fulfil all its aspirations, and we have now at our disposal men thoroughly well trained who, at comparatively small expense, could be retained to give invaluable service to the country. We have left our war problems and returned to our laboratories, but we find our difficulties are not at an end. We find that wages have gone up, the cost of material has gone up, and our finances, slender enough before the war, are now totally inadequate. Your President has said that it would be disastrous if the progress of research was stopped in this country by lack of funds. The country is poor. It has been made poor by the War, and it is clear that not very much can be done by redistribution. If you were to distribute income and profits to the limit, and everybody received the same amount, you would not receive the standard demanded, and perhaps rightly demanded, by the labouring classes. The only hope of the country is increased production. It may be para-

doxical, but it is true, that the greater our poverty the more we ought to spend on education and research. We are somewhat in the position of a landowner whose income has failed. What should we think of him if he attempted to economise by cutting off manure or seeds or the machinery for farming his land? His hope would be to develop his source of income, and to my mind that is the only hope of our country in these difficult times—to develop all the assets the country possesses, and not the least of these is the intelligence and ability of our young men. We have in this country an immense amount of ability that has never yet been tapped, and I feel confident as regards this, because we are now blessed with a Minister of Education who recognises the importance of both education and research to a measure that has not been given to any of his predecessors."

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on May 1st, 1919, at 8 p.m., when a ballot for the election of Fellows will be held, and Professor J. H. Jeans, F.R.S., will deliver a lecture entitled, "The quantum theory and new theories of atomic structure."

RESEARCH FUND.

A meeting of the Research Fund Committee will be held in June next. Applications for Grants, to be made on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, W., must be received on or before Monday, June 2nd, 1919.

All persons who received grants in June, 1918, or in June of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by Monday, June 2nd, 1919.

The Council wish to direct attention to the fact that the income arising from the donation of the Worshipful Company of Goldsmiths is to be more or less especially devoted to the encouragement of research in inorganic and metallurgical chemistry. Furthermore, that the income due to the sum accruing from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the coal-tar and allied industries.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, May 1st, 1919, at 8 p.m., Sir JAMES J. DOBBIE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the irreparable loss chemical science and the Society had sustained through the death of Sir William Crookes. Among the services of Sir William Crookes to the Society mention was made of those rendered as a Member of Council (1866—1870), as a Vice-President (1876—1879, 1885—1887), and as President (1887—1889).

Certificates were read for the first time in favour of:

Donald Bagley, 1, Glenmore Road, Hampstead, N.W.3.
Ananda Kishore Das, M.A., B.Sc., Government College, Gauhati, Assam, India.
Louis Charles Kemp, Mountfield, Robertsbridge.
Owen Leonard Maund, 4A, Cresswell Grove, West Didsbury, Manchester.
Rustom Jeejeebhoy Mistri, Back Bay View, Mathew Road, Girgaon, Bombay, India.
Arthur Pinkerton, Glen Moor, Ramsbottom, Lancs.
Dudley Cloete Vining, 206, Stanstead Road, Forest Hill, S.E.23.
William Wardlaw, M.Sc., The University, Edmund Street, Birmingham.

Dr. C. Dorée and Mr. H. M. Langton were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Lionel Conrad Andrews, B.Sc.
Nicholas Lionel Anfilogoff.
William Herbert Fletcher Armstrong, M.A
William Henry Barrett.
Edward Bloom, B.Sc.
William Brash, B.Sc.
Robert Parmenter Burwell, B.Sc.
Robert Macfarlane Clark, B.Sc.
Isaac Cohen.

Walter Hatton Crouch.
David Merfyn Davies.
Harry Eade Dear, B.Sc.
Surendra Nath Dey, B.A.
Surendranath Dhar.
Reginald Gordon Doyle.
James Ross Fraser.
Frederick Freeth.
Ralph Eddowes Garrod, M.A.
James Edward Grainger.
Edgar Thomas Griffiths.
Thomas Owen Griffiths, B.Sc.
Thomas Haigh, B.A.
Charles Hall.
Fredk. John Spencer Hall.
Vernon Percy Hart.
John Henry Harvey.
Frederick Denison Maurice Hocking.
George Hugh Hodgson.
Sidney John Hopkins.
Armand Houssa, B.Sc.
Fred Hughes.
Edward John Jones.
George Armand Robert Kon, B.A.
Henry Lawrence Long, B.Sc.
William McHutchison, B.Sc.
William Angus McIntyre, B.Sc.
John Alexander McNaughton.
Frederick George Mann, B.Sc.
George Stanley Withers Marlow, B.Sc.
Frank Matthews, B.Sc.
Samuel Mellins.
Lazarus Mendel.
Francis William Moorhouse.
James Morris.
Kishori Lal Moudgill, B.Sc.
Marriappa Parthasarathy.
Rames Chandra Ray, M.Sc.
John David McBeath Ross, M.A., B.Sc.
Hari Das Sen, M.Sc.
Walter Shepherd.
Nathan Singer.
Walter Bernard Smith, B.Sc.
Kalyan Chennakesava Srinivasan, M.A.
Ernest Henry Stenning, B.A.
Cyril Heath Stephenson, B.A.
Edmund Joseph Sterne.
Frederick Thomas Stevenson.
Ralph William Ewart Stickings, B.Sc.
Stanley Goulden Thompson.
Harold George Tribley.
Ernest Turner, B.Sc.
Alfred Sydney Vince.
Walter Wahl.
Orr Walker.
Albert Edward Wallis.
William Arthur Walmsley, B.Sc.
Donald Willoughby Capon West.

Professor J. H. Jeans, M.A., F.R.S., then delivered his lecture, entitled "The Quantum Theory and New Theories of Atomic Structure." A vote of thanks to Professor Jeans for his lecture, proposed by Professor H. E. Armstrong and seconded by Professor Lindeman, was carried with acclamation.

Extraordinary General Meeting, Thursday, May 8th, 1919, at 5.30 p.m., Sir James J. Dobbie, D.Sc., F.R.S., President, in the Chair.

The President referred to the steps which the late Council had taken in connexion with the revision of the Bye-laws, and which had resulted in the calling of the present meeting.

The following Resolutions were then put to the meeting in succession:

1. That women should be admitted to the Society on the same terms as men.
2. That in the election of Officers and Council a postal vote of Fellows resident in the United Kingdom should be taken.
3. That every alteration of the Bye-laws should require for its adoption a two-thirds majority of those voting.
4. That no alteration of the Bye-laws should become effective until one month after its adoption has elapsed, within which period it should be competent for not less than thirty Fellows to demand a poll of all Fellows resident in the United Kingdom.
5. That the number of ordinary members of Council should be raised to at least eighteen.
6. That the class of Associates should be abolished.
7. That the term "Honorary and Foreign Members" should be replaced by "Honorary Fellows."
8. That the limit placed by the Charter on the yearly value of the Society's premises should be raised.

These eight resolutions were proposed in each case by Professor J. C. Philip and seconded by Dr. J. W. Leather, Professor A. Harden, Mr. E. G. Hooper, Mr. E. G. Hooper, Mr. J. Connah, Professor J. T. Hewitt, Dr. A. G. Vernon Harcourt, and Dr. G. Senter respectively. Resolutions 1—6 and 8 were carried *nem. con.*, and resolution 7 was carried by a large majority.

Professor Philip then moved the following resolution:

9. That the Council be and hereby is empowered to take steps to secure a Supplemental Charter giving the necessary power to alter the Bye-laws in the sense of the foregoing resolutions.

This proposal was seconded by Mr. E. Grant Hooper. After discussion, in which a number of Fellows took part and in which reference was made to the possibility of future co-operation with other societies, Professor Philip moved the addition of the following words to the foregoing resolution: "and granting, if found desirable and possible, increased liberty in the direction of co-operation with allied societies." Mr. E. Grant Hooper seconded, and the resolution, in its amended form, was carried *nem. con.*

Ordinary Scientific Meeting, Thursday, May 15th, 1919, at 8 p.m., Sir James J. Dobbie, D.Sc., F.R.S., President, in the Chair.

Reference was made to the loss which the Society had sustained in the death, on June 25th, 1918, of Mr. David Bendix, who was elected a Fellow on December 17th, 1874.

Messrs. N. L. Anfilogoff, H. S. Bolton, R. G. Doyle, S. N. Dhar, J. R. Fraser, G. S. W. Marlow, L. Mendel, F. D. M. Hocking, R. W. E. Stickings, J. D. M. Ross, and A. S. Vince were formally admitted as Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

Edgar Beard, B.Sc., 88, Winchester Road, Brislington, Bristol.
Alfred Randolph Campbell, 205, Albert Road, Pollokshields, Glasgow.
Algernon George Crossley, 36, Park Parade, Harlesden, N.W. 10.
Manik Lal Dey, M.Sc., Naini Tal, U.P., India.
Archibald Wooster Frame, Royal Hotel, Derby.
John William Gardom, 235, Park Street, Luton.
Robert Stephen Glennie, 9, Longbeach Road, Clapham, S.W. 4.
Harry Harper, B.Sc., 7, Selborne Grove, Keighley.
Herbert Hollings Jacques, B.Sc. Eng., 26, Wellington Road, Smethwick, Staffs.
Morvan Lapworth, B.Sc., 44 Wilton Crescent, Wimbledon, S.W. 19.
Brian Mead, 29, Wellington Road, Bournemouth.
Sidney Owen Rawling, B.Sc., Tresco, Launceston.
John David Smith, 10, Denbigh Place, S.W. 1.
Arnold Teichfeld, 70, St. Mary's Mansions, Paddington, W. 2.
Ernest Edward Whale, B.Sc., 167, Trinity Road, Wandsworth Common, S.W. 17.
David Wingate, Ardmanoch, Tollcross, Glasgow.
Arthur Samuel Wood, B.Sc., 6, Walton Road, Sidcup, Kent.
George Ernest Yarrow, B.Sc., 8, First Avenue, Heaton, Newcastle-on-Tyne.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (3):

Philip Drinker, B.S., South Bethlehem, Penn., U.S.A.
Edward John Wall, 110, Brookline Avenue, Boston, U.S.A.

The following paper was read:

"Blue John" and other forms of fluorite." By B. Blount and J. H. Sequeira.

RESEARCH FUND.

A meeting of the Research Fund Committee will be held in June next. Applications for Grants, to be made on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, W.1, must be received on or before Monday, June 2nd, 1919.

All persons who received grants in June, 1918, or in June of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by Monday, June 2nd, 1919.

The Council wish to direct attention to the fact that the income arising from the donation of the Worshipful Company of Goldsmiths is to be more or less especially devoted to the encouragement of research in inorganic and metallurgical chemistry. Furthermore, that the income due to the sum accruing from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the coal-tar and allied industries.

ADDITIONS TO THE LIBRARY.

I. *Presented by the late Mr. Sydney Lupton.*

BRANDE, WILLIAM THOMAS. A manual of chemistry. 6th edition. 2 vols. (Vol. I in 2 parts.) London 1848. pp. cv + 1950. ill.

BRITISH ASSOCIATION. Reports 1864 to 1917. London 1865—1918. (*For circulation.*)

CHEMICAL GAZETTE. Vols. 1 to 12. London 1843—1854. (*For circulation.*)

CHEMICAL SOCIETY. Memoirs and Proceedings, Journal, etc. London 1841 to 1914.

GRAHAM, THOMAS. Elements of chemistry; including the applications of the science in the arts. 2nd edition. Vol. I. London 1850. pp. viii + 632. ill.

GRAY, ANDREW. Lord Kelvin. An account of his scientific life and work. London 1908. pp. viii + 319. ill.

GRIFFITHS, E. H. The thermal measurement of energy. Lectures delivered at the Philosophical Hall, Leeds. Cambridge 1901. pp. viii + 135. ill.

JOULE, JAMES PRESCOTT. Scientific papers. London 1884—1887. 2 vols. pp. xxix + 657, xiii + 391. ill.

LIEBIG, JUSTUS VON. Chemistry and physics in relation to physiology and pathology. London 1846. pp. 116.

LODGE, SIR OLIVER. Electrons: or the nature and properties of negative electricity. London 1906. pp. xv + 230. ill.

LUBBOCK, SIR JOHN. Fifty years of science. Being the address delivered at York to the British Association, August 1881. 3rd edition. London 1882. pp. 90.

LUPTON, SYDNEY. Elementary chemical arithmetic with 1100 problems. London 1882. pp. xii + 286.

—— Chemical arithmetic with twelve hundred examples. 2nd edition. pp. xii + 171.

MARTIN, GEOFFREY [and others]. Industrial and manufacturing chemistry. Organic. London 1913. pp. xx + 726. ill. (Second copy.)

[PEREIRA, JONATHAN.] Lectures on polarized light, delivered before the Pharmaceutical Society of Great Britain; and in the Medical School of the London Hospital. London 1843. pp. viii + 110. ill.

PHILLIPS, JOHN ARTHUR. A manual of metallurgy, or practical treatise on the chemistry of the metals. London 1852. pp. xx + 605. ill.

PHYSICAL SOCIETY OF LONDON. Proceedings, Vols. 1 to 28, and Abstracts, Vols. 1 to 3. London 1876—1916. (*For circulation.*)

RAMSAY, SIR WILLIAM. Experimental proofs of chemical theory for beginners. London 1884. pp. xiv + 134.

—— Essays biographical and chemical. London 1908. pp. vii + 247. ill.

ROSCOE, SIR HENRY ENFIELD. John Dalton and the rise of modern chemistry. London 1895. pp. 216. ill.

SCIENCE ABSTRACTS. Physics and electrical engineering, Vols. 1 to 7. Physics, Vols. 8 to 19. London 1898—1916. (*For circulation.*)

SOCIETY OF CHEMICAL INDUSTRY. Journal, Vols. 1—36. Collective Indexes, 2 vols. London 1882—1917. (*For circulation.*)

THOMSON, SIR JOSEPH JOHN. Applications of dynamics to physics and chemistry. London 1888. pp. viii + 312.

THORPE, SIR THOMAS EDWARD. Joseph Priestley. London 1906. pp. viii + 228. ill.

WHEATSTONE, SIR CHARLES. Scientific papers. London 1879. pp. xiii + 380. ill.

WILLIAMS, HENRY SMITH. The story of nineteenth-century science. London 1900. pp. viii + 475. ill.

WURTZ, ADOLPHE C. An introduction to chemical philosophy according to the modern theories. Translated by SIR WILLIAM CROOKES. London 1867. pp. viii + 192.

II. *Presented by Sir Arthur W. Soward, C.B.*

BECQUEREL, LOUIS ALFRED, and RODIER, A. Pathological chemistry, in its application to the practice of medicine. Translated by STANHOPE TEMPLEMAN SPEER. London 1857. pp. xxiv + 566.

BERZELIUS, JÖNS JACOB. An attempt to establish a pure scientific system of mineralogy, by the application of the electrochemical theory and the chemical proportions. Translated from the Swedish by JOHN BLACK. London 1814. pp. 144.

BEUDANT, FRANÇOIS SULPICE. Recherches tendantes a déterminer l'importance relative des formes cristallines, et de la composition chimique dans la détermination des espèces minérales. Paris 1817. pp. 32.

CHARRAS, MOSES. The Royal pharmacopœa, galenical and chymical, according to the practice of the most eminent and learned physitians of France. London 1678. pp. [iv] + 245 + [xvii]. ill.

CHEVREUL, MICHEL EUGÈNE. Recherches chimiques sur les corps gras d'origine animale. Paris 1823. pp. xvi + 484. ill. (Second copy.)

DAVY, JOHN. Memoirs of the life of Sir Humphry Davy. 2 vols. London 1836. pp. xii + 507, vii + 419. ill.

FARADAY, MICHAEL. A course of six lectures on the various forces of matter and their relations to each other. Edited by SIR WILLIAM CROOKES. 2nd edition. London 1860. pp. vi + 179. ill.

FRANKLIN, BENJAMIN. Complete works . . . with memoirs of his early life. 3 vols. London 1806. pp. xiv + 440 + [xxxvi], vi + 468, vi + 552.

HALL, THOMAS WRIGHT. The electrothermology of chemistry. Edinburgh 1872. pp. x + 173.

HAÜY, RÉNÉ-JUST. Essai d'une théorie sur la structure des crystaux, appliquée a plusieurs genres de substances crystallisées. Paris 1784. pp. [iv] + 236. ill.

—— Tableau comparatif des résultats de la cristallographie et de l'analyse chimique, relativement a la classification des minéraux. Paris 1809. pp. lvi + 312. ill.

HORTULANUS, FONTANUS. Fatá Chymica, in Beschreibung der wahren und falschen Chymie, mit beygefügten acht raren Tractætgen und zum Theil alten kostbahren Manuscriptis. Cassel 1740. pp. [xvi] + 464. ill.

INSTRUCTION sur l'établissement des nitrières, et sur la fabrica-

tion du salpêtre. 2nd edition. Paris, An II de la Republique. pp. 96. ill.

KIRCHER, ATHANASIUS. Iter extaticum cœleste . . . hac secundâ editione prælusionibus et scholiis illustratum . . . a Gaspare Schotto; accessit iter exstaticum terrestre, et synopsis mundi subterranei. Herbipoli 1660. pp. [xix]+689+[xviii]. ill.

LA METHERIE, JEAN CLAUDE DE. Essai analytique sur l'air pur, et les différentes espèces d'air. 2nd edition. 2 vols. Paris 1788. pp. viii+447, vi+608.

LAVOISIER, ANTOINE LAURENT. Elements of chemistry, in a new systematic order, containing all the modern discoveries. Translated from the French by ROBERT KERR. Edinburgh 1790. pp. l+511. ill.

LIEBIG, JUSTUS. Handbook of organic analysis; containing a detailed account of the various methods used in determining the elementary composition of organic substances. Edited by A. W. HOFMANN. London 1853. pp. viii+135. ill.

MITCHILL, SAMUEL L. Explanation of the synopsis of chemical nomenclature and arrangement: containing several important alterations of the plan originally reported by the French Academicians. New York 1801. pp. 44.

PRIESTLEY, JOSEPH., Experiments and observations on different kinds of air. 3 vols. London 1774—77. pp. xxvii+324, xliv+399+[xxi], xl+411+[viii]. ill.

PROUT, WILLIAM. Chemistry, meteorology, and the function of digestion considered with reference to natural theology. London 1834. pp. xxviii+565. ill.

ROSCOE, SIR HENRY ENFIELD. The history of the chemical elements: a lecture delivered in the City Hall, Glasgow. London 1875. pp. 22. ill.

—— Technical chemistry. (*Science Lectures at South Kensington.*) London 1877. pp. 46. ill.

THOUGHTS on the properties and formation of the different kinds of air; with remarks on vegetation, pyrophori, heat, caustic salts, mercury, and on the different theories upon air. London 1785. pp. ix+330.

III. *Miscellaneous Donations.*

BLOMSTRAND, CHRISTIAN WILHELM. Die Chemie der Jetztzeit vom Standpunkte der electrochemischen Auffassung aus Berzelius Lehre entwickelt. Heidelberg 1869. pp. xx+417. (*Reference.*) From Dr. J. McCrae.

BOARD OF AGRICULTURE. Journal. Vol. 25, no. 11, etc. London 1919+. (*Reference.*) From the President.

BOARD OF TRADE. Journal and Commercial Gazette. Vol. 102, no. 1161, etc. London 1919+. (*Reference.*) From the Editor.

—— COMMISSIONER FOR DYES. Statistics of the synthetic dyestuffs imported into the United Kingdom during the year 1913. London 1918. pp. x+168. (*Reference.*)

From the Commissioner.

CHEMICAL ENGINEERING CATALOG. Collected, condensed and standardized catalogs of chemical engineering equipment and machinery, also heavy and light chemicals, dyestuffs, alloys, ores, oils and raw materials for manufacturing industries. With a general classified directory. 3rd annual edition, 1918. New York 1918. pp. 836. (*Reference.*)

From the Chemical Catalog Company, Inc.

GIUA, MICHELE. Chimica delle sostanze esplosive. Milano 1919. pp. xiii+557. ill. L.28. (*Recd.* 27/2/19.)

From the Publisher: Ulrico Hoepli.

HENDERSON, GEORGE GERALD. Catalysis in industrial chemistry. London 1919. pp. ix+202. 9*s.* net. (*Recd.* 26/2/19.)

From the Author.

LONDON CHAMBER OF COMMERCE. The Chamber of Commerce Journal. Vol. 38, no. 298, etc. London 1919+. (*Reference.*)

From the Chamber.

MINISTRY OF MUNITIONS. DEPARTMENT OF EXPLOSIVES SUPPLY. First and Second Reports on costs and efficiencies for H.M. Factories controlled by Factories Branch. London 1918. 2 vols. pp. 79, 134. ill. (*Recd.* 3/2/19.)

PERKIN, ARTHUR GEORGE, and EVEREST, ARTHUR ERNEST. The natural organic colouring matters. London 1918. pp. xxii+655. 28*s.* net. (*Recd.* 19/2/19.) From Professor A. G. Perkin.

RÂY, SIR PRAFULLA CHANDRA. Essays and discourses. With a biographical sketch and a portrait. Madras 1918. pp. xxxii+349. Rs.3. (*Recd.* 4/3/19.)

From the Publishers: G. A. Natesan and Co.

REGIA STAZIONE CHIMICO AGRARIA SPERIMENTALE DI ROMA. Annali. Serie ii. Vols. 1 to 8. 1906—1916. Rome 1907—1916. (*Reference.*) From the Director.

SOCIÉTÉ DE CHIMIE INDUSTRIELLE. Chimie et Industrie. Vol. I, etc. Paris 1918+. (*For circulation.*)

From the Faraday Society.

SOCIÉTÉ SUISSE DE CHIMIE. Helvetica Chimica Acta. Vol. I, etc. Basle 1918. (*For circulation.*) From the Faraday Society.

STEWART, ALFRED WALTER. Recent advances in organic chemistry. 3rd edition. London 1918. pp. xx+350. 14*s.* net. (*Recd.* 14/3/19.) From the Author.

WARNES, ARTHUR ROBERT. Coal tar and some of its products. London 1919. pp. xxii+105. ill. 2*s*. 6*d*. net. (*Recd*. 12/3/19.)
From the Publishers: Sir Isaac Pitman and Sons.

IV. *By Purchase.*

AMERICAN CERAMIC SOCIETY. Journal. Vol. 2, etc. Easton, Pa., 1919+. (*Reference.*)

AMERICAN LEATHER CHEMISTS ASSOCIATION. Journal. Vol. 14, etc Easton, Pa., 1919+. (*Reference.*)

BARBET, ÉMILE. Rectification de l'air liquide. Séparation et purification des gaz de l'atmosphère. Paris 1918. pp. 136+iv. ill. 12*s*. 6*d*. (*Recd*. 18/3/19.)

BOURRY, EMILE. A treatise on ceramic industries. Revised translation from the French with some critical notes by ALFRED B. SEARLE. London 1911. pp. viii+480. ill. 14*s*. 6*d*. net. (*Recd*. 15/2/19.)

BUTLER, G. MONTAGUE. Handbook of mineralogy, blowpipe analysis and geometrical crystallography. London 1918. pp. ix+311, v+80, viii+155. ill. 16*s*. 6*d*. net. (*Recd*. 14/5/10.)

CAOUTCHOUC ET LA GUTTA-PERCHA, LE. Year 16, etc. Paris 1919+. (*Reference.*)

CHEMICAL AND METALLURGICAL ENGINEERING. Vol. 20, etc. New York 1919+. (*Reference.*)

CHEMISCHE UMSCHAU AUF DEM GEBIETE DER FETTE, Oele, Wachse und Harze. Year 26, etc. Stuttgart 1919+. (*Reference.*)

CONN, H. W. Agricultural bacteriology. A study of the relation of germ life to the farm with laboratory experiments for students. 3rd edition. Philadelphia 1918. pp. x+357. ill. 11*s*. net. (*Recd*. 10/3/19.)

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CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY MEETING ON JUNE 19, 1919.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

BAGLEY, DONALD, 1, Glenmore Road, Hampstead, N.W. 3. Engineer, coke ovens, by-product plant, explosives, etc. Interested in chemical works. Manufacturing chemistry. (*Signed by*) Ernest Fyleman, E. de Barry Barnett, Samuel Smiles, Walter A. N. Hardwick, W. B. Tuck.

BEARD, EDGAR, 88, Winchester Road, Brislington, Bristol. Chemist. Messrs. James Robertson and Sons, Ltd., Bristol. B.Sc. (Edin.), Associate of the Institute of Chemistry. Published "Enzyme Action and Surface Tension," Beard and Cramer, *Proc. Roy Soc.*, 1915. Demonstrator in Physiological Chemistry, Edin Univ. Chemist, H.M. Factory, Gretna. (*Signed by*) James Walker, Sydney A. Kay, John E. Mackenzie, Leonard Dobbin, H. Gordon Rule.

BELL, WILFRID ANDREWS, 4, St. Michael's Terrace, Headingley, Leeds, Yorkshire. Works chemist with Messrs. Brotherton and Co., Tar and Ammonia Distillers, Leeds. Diploma of Bradford Technical College in Chemistry and Dyeing, representing five years as a day student. Five years as chemist with Messrs. John Crossley and Sons, Halifax, and Messrs. Brotherton. Experience abroad in colour works of Bayer and Co., Elberfeld, and Grüsheim Electron Co., Frankfurt. (*Signed by*) Victor Steele, A. R. Runeckles, S. M. Sutcliffe, Walter M. Gardner, *B. A. Burrell.*

CAMPBELL, ALFRED RANDOLPH, 205, Albert Road, Pollokshields, Glasgow. Analytical chemist. I have been employed for eight years by Messrs. R. R. Tatlock and Thomson, analytical and consulting chemists and assayers, 156, Bath Street, Glasgow, during which time I have been engaged in analytical chemistry in all its branches. At present I am in charge of all mineral and metallurgical analyses carried out by my employers. I received my theoretical chemistry training in the Royal Technical College, Glasgow. (*Signed by*) R. R. Tatlock, R. T. Thomson, Geo. Grant, Alex. W. McLaren, T. Greetham.

CROSSLEY, ALGERNON GEORGE, 36, Park Parade, Harlesden, N.W. 10.

Works chemist to Messrs. T. Illingworth and Co., Ltd., Willesden, N.W. 10. Minor qualification of the Pharmaceutical Society of Great Britain (M.P.S.), and for the last seven years works chemist to Messrs. T. Illingworth and Co., Ltd., photographic paper manufacturers. (*Signed by*) J. B. Coleman, F. H. Lowe, J. C. Crocker, *H. Jephcott*, *O. A. Le Beau*, *A. Coulthard*.

DÁS, ANANDA KISHORE, Gauhati, Assam, India. Professor of Chemistry, Government College, Gauhati. B.Sc., M.A. in Chemistry, Calcutta University (1908); demonstrator in chemistry in the Government College (1909–1918); professor of chemistry since 1918; joint author of papers (1) "Diketohydrindene"; (2) "Synthesis of Pyranol derivatives," read before "All India Science Congress," and published in the proceedings of "Asiatic Society of Bengal." (*Signed by*) David Thomson, Ramtaran Sen, Gunendranath Raye, Sarat Chandra Chatterjee, Brojendra Nath Ghosh.

DEY, MANIK LAL, Naini Tal, U.P., India. Assistant to Chemical Inspector, Indian Ordnance Department. (1) Master of Science of the University of Calcutta; (2) formerly Sir Rash Behary Ghosh Research Scholar of the University of Calcutta; (3) joint author of several original papers published in the *Journal of the Chemical Society*. (1) "Guanidinium Nitrite and its Decomposition by Heat," by P. C. Rây, M. L. Dey, and S. C. Jana (*Proc. of the Chem. Soc.*, **29**, 1913); (2) "Interaction of Iodine and Thioacetamide in Aqueous and Alcoholic Solutions," by P. C. Rây and M. L. Dey (*Trans. of the Chem. Soc.*, **109**, 1916); (3) "Velocity of Decomposition and the Dissociation Constant of Nitrous Acid," by P. C. Rây, M. L. Dey, and J. C. Ghosh (*Trans. of the Chem. Soc.*, **111**, 1917); (4) "Synthesis of αβ-Thiocrotonic Acid," by P. C. Rây and M. L. Dey (*Trans. of the Chem. Soc.*, **111**, 1917); (5) "Mercuric Sulpho-iodide, a Case of Reversible Phototrophy," preliminary note, by M. L. Dey (*Report of the Indian Association for the Cultivation of Science*, 1917). (*Signed by*) Arthur Marshall, J. Bhaduri, P. C. Rây, B. C. Dutt, B. B. Dey.

ERRINGTON, JOHN MOUSON, 41, Fitzroy Street, London, W. 1. Dyeing technologist to the Bow Bridge Dyes and Chemical Works. Trained as dyeing technologist at Bradford Technical College; holder of London City and Guilds passes in Chemical Tech. of wool, cotton, and silk dyeing; medallist in silk dyeing; six years with various companies as technical chemist, and now holding the above position. (*Signed by*) J. C. Cain, Daniel L. Couch, George Reeves, Edw. C. Powell, W. H. Simmons.

FRAME, ARCHIBALD WOOSTER, Royal Hotel, Derby. Chemist. Graduate Univ. of Mich. (1910), Ph.C. (*Signed by*) Edward C. Worden, John F. Briggs, W. A. Dickie, Edgar P. Hedley, Wm. P. Skertchly.

GARDOM, JOHN WILLIAM, 235, Park Street, Luton, Beds. Metallurgist. Assistant to Prof. H. C. H. Carpenter; assistant metallurgist, Royal Aircraft Factory; research chemist, Electro-metallurgical Committee, Ministry of Munitions; chief assistant research metallurgist, Skefko Ball Bearing Co. (*Signed by*) W. E. Hughes, C. A. Edwards, Henry Stephen, J. E. Myers, H. B. Dixon.

GLENNIE, ROBERT STEPHEN, 9, Longbeach Road, Clapham, London, S.W. Lecturer in Pharmaceutics, Battersea Polytechnic. Qualified pharmaceutical chemist; member of Pharmaceutical Society of Great Britain. (*Signed by*) J. B. Coleman, F. H. Lowe, J. C. Crocker, Frank Matthews, *H. Jephcott*.

GODFREY, CECIL, 46, Mapesbury Road, Cricklewood, London, N.W.2. Chemist. A.R.C.S. diploma in Chemistry; D.I.C. diploma for advanced study and research in Chemical Technology; have done research on the isolation and identification of resinous bodies in coal, with Professor W. A.

Bone, F.R.S. (*Signed by*) H. F. Harwood, Arthur A. Eldridge, P. W. Robertson, A. T. King, James C. Philip.

HADFIELD, SIDNEY HERBERT, 15, East View, Preston. Pharmacist and consulting chemist. Hon. Pharmacist Moor Park Military Hospital, Preston; member of Pharmaceutical Society of Great Britain; author of "Man Power in the Making," lecture delivered St. Mary's Wesley Guild, June, 1918; "Chemistry of Rhubarb," contribution to *Lancashire Daily Post*, May, 1917, re poisoning from rhubarb leaves at Enfield. (*Signed by*) Harold B. Dixon, William A. Bone, J. Garth, R. Henry Jones, *Edward Halliwell.*

HARPER, HARRY, 7, Selborne Grove, Keighley. Teacher. A.R.C.S.; 1st class in chemistry, B.Sc., full technological cert. in iron and steel manufacture, wool, cotton, and silk dyeing; assistant lecturer in chemistry, Huddersfield Tech. Coll. (1900–03); assistant science master, Huddersfield Secondary School (1903–09); lecturer in chemistry, Keighley Trade and Grammar School, and Tech. Institute (1909—); author (joint) of "Practical Chemistry" (Macmillan and Co.). (*Signed by*) S. F. Dufton, Arthur Smithells, James Bruce, Barker North, Walter M. Gardner, *L. Gordon Paul.*

JACQUES, HERBERT HOLLINGS, A.R.C.Sc., B.Sc. (Eng.), 26, Wellington Road, Smethwick, Staffs. Head of the Engineering Department (Mechanical), Municipal Technical School, Crocketts Lane, Smethwick. Student (Inorganic and Organic Chemistry), four years, Secondary School, Heckmondwike; assistant master (chemistry), one year, Secondary School, Heckmondwike; student (chemistry), Royal College Science, London, 1904–5; research chemist, Research Department, Woolwich Arsenal, two years, 1917–19. I wish to keep abreast of modern developments for engineering purposes. (*Signed by*) R. S. Cahill, C. E. Womersley, G. B. Stones, Arthur Adams, *A. R. Gower.*

KEMP, LOUIS CHARLES, Mountfield, Robertsbridge. Chemical engineer and manager at Gypsum Mines, Ltd., Robertsbridge. Studied chemistry at Finsbury Technical College under the late Professor Meldola, F.R.S., and in the laboratory of the late William Joel Kemp, F.I.C. (*Signed by*) Gerald T. Moody, M. O. Forster, Henry E. Armstrong, G. T. Morgan, A. J. Hale, William R. Grist.

KING, HERBERT JOSEPH SEYMOUR, 13, St. James Road, Watford. Teacher. B.Sc. London; 2nd class Hons. in Chemistry; research student in Chemistry at Birkbeck College. (*Signed by*) F. Barrow, George Senter, H. D. K. Drew, Alfred J. White, G. H. Martin, E. D. Griffiths.

KIPPING, CYRIL HENRY STANLEY, 40, Magdala Road, Nottingham. Schoolmaster (Science). M.A. (Camb.); 1st Class Part I. and Part II., Nat. Sci. Tripos; four years science master at Weymouth College. (*Signed by*) H. J. H. Fenton, F. W. Dootson, C. S. Gibson, A. J. Berry, W. H. Mills.

LAPWORTH, MORVAN, 44, Wilton Crescent, Wimbledon, S.W. 19. Research chemist. A.R.C.Sc. (Chemistry); B.Sc. (Hons.), Chemistry. (*Signed by*) H. B. Baker, Jocelyn Thorpe, James C. Philip, H. F. Harwood, Arthur A. Eldridge.

MACALLUM, ERNEST NEIL, 243, College Street, Toronto, Ontario, Canada. President of the Synthetic Drug Co., Ltd.; President of the Diarsenol Co., Ltd.; manufacturer of salvarsan and neosalvarsan, Canada and U.S.; President of the Diarsenol Co., Incorporated (U.S.); President of the Synthetic Drugs, Ltd. (Canada and U.S.). Experience in post graduate research chemistry under Prof. W. H. Perkin (Oxford), Prof. Schultz (Munich), Prof. Donnan (London), and Assist. Prof. Boswell (Toronto); experience in physical research under Prof. J. C. McLennan (Toronto). (*Signed by*)

A. Bruce Macallum, W. H. Perkin, R. G. Fargher, R. R. Baxter, *Henry E. Armstrong, Arthur Harden.*

MADDEN, DENIS, 40, Wellington Road, St. Luke's, Cork. Lecturer in chemistry. A.I.C., A.R.C.Sc.I. (Applied Chemistry); late demonstrator in chemistry, University College, Galway; instructor in chemistry (summer courses) in Royal College of Science, Dublin. At present head of chemistry department, Crawford Municipal Technical Institute, Cork. (*Signed by*) W. E. Adeney, A. G. G. Leonard, A. O'Farrelly, *Daniel J. O'Mahony, Thos. Farrington.*

MAUND, OWEN LEONARD, 4A, Cresswell Grove, West Didsbury, Manchester. Chemist. Member Pharmaceutical Society; continuation chemical knowledge. (*Signed by*) C. Polychronis, Burrows Moore, A. Hancock, *F. M. Rowe, F. Bayley, E. A. Bearder.*

MEAD, BRIAN, 29, Wellington Road, Bournemouth. Student. Training at Bournemouth School, 1904–1913; at Bournemouth Municipal College, 1913–1914; at Reading University College, 1914–1915 (to date of joining Colours). London Intermediate B.Sc., 1914. (*Signed by*) H. Bassett (jun.), J. W. Dodgson, Hubert Painter, W. G. Sewell, *C. H. H. Walker.*

MISTRI, RUSTOM JEJEEBHOY, "Back Bay View," Mathew Road, Girgaon, Bombay. Analytical chemistry. Analytical and technical chemist (especially concerned with textile and engineering chemistry). (*Signed by*) T. K. Gajjar, D. D. Kanga, M. J. Gajjar, J. Fraser, *Kapibram H. Vakil.*

VAN OVERSTRAETEN, CHARLES JEAN STANISLAS, 38, Cole Park Road, Twickenham. Chairman and managing director of the C.V.O. Chemical Works, Ltd., Richmond. Studied chemistry at Brussels University; six years technical manager in oil refining in Brussels; one year technical manager in oil refinery in England; at present managing director of C.V.O. Chemical Works, Ltd., Richmond, Surrey. Author of special processes for the manufacture of medicinal oils, fats, and lanoline. (*Signed by*) W. H. Simmons, Edward L. Joseph, H. H. Robins, *W. E. Oakden, F. H. Lowe.*

PINKERTON, ARTHUR, Glen Moor, Ramsbottom, Lancashire. Technical chemist. Late chemist and assistant superintendent of the Bradford Dyeing Association (U.S.A.), Niautic (Bradford), Rhode Island, United States of America; member of the American Chemical Society; (1915, England), head chemist to the Greenfield Mill Co., Ltd., Hadfield, Derbyshire; (1917, England) chief chemist of the British and Foreign Supply Association, Branch of the Ministry of Munitions; (1918) technical administrator of H.M. Cotton Waste Mills (11 in all); on headquarter staff of Propellants Branch of the Ministry of Munitions; engaged in the purification of cotton waste and other cottons for the manufacture of explosives; responsible for re-organising said mills, controlling process, and supervising experimental work on behalf of the Ministry. (*Signed by*) W. Howieson Gibson, John Horsfall, Edmund Knecht, *Robert Robertson, Harold J. Page, A. Forster.*

RAWLING, SIDNEY OWEN, "Tresco," Launceston, Cornwall. Post-graduate student, University College, London. B.Sc., Honours Chemistry, London, 1914; A.I.C., 1917; wishes to take the *Journal* of the Society and to have the use of the Library. (*Signed by*) Samuel Smiles, W. B. Tuck, R. E. Slade, Irvine Masson, G. I. Higson.

SMITH, JOHN DAVID, 10, Denbigh Place, S.W.1. Chemical research student. Chemical research student at Finsbury Technical College; formerly assistant science master at the Scarborough Municipal Secondary School. (*Signed by*) G. T. Morgan, F. E. Matthews, William R. Grist, F. Page Evans, H. M. Atkinson.

SMITH, SIDNEY ALBERT LEWIS, 85, Portsmouth Road, Woolston, Southampton. Analytical chemist. About sixteen years' experience as junior and senior assistant chemist in laboratories of Royal Gun and Carriage Factories, Woolwich; about fifteen months as senior assistant and chief chemist in laboratory of Government Rolling Mills, Southampton. (*Signed by*) R. J. Redding, A. H. Mundey, H. H. Smith, J. B. Farlie, *S. Field.*

STEPHENSON, CYRIL RICHARD WILLIAM, Murrayville, Juniper Green, Edinburgh. Principal teacher of science, The High School, Juniper Green, Edinburgh; headmaster of Juniper Green Continuation School. B.Sc. Honours (Leeds), M.Sc. (Leeds); teacher of chemistry to papermakers, Juniper Green, 1917–19; teacher of chemistry under Ayrshire County Secondary Education Committee, 1915–17; science master, Prestwick High School, 1912–17; research work in bio-chemistry at Heriot Watt College, Edinburgh, 1918. (*Signed by*) Arthur Smithells, W. Lowson, H. M. Dawson, W. H. Perkins, A. Archibald Boon.

TEICHFELD, ARNOLD, 70, St. Mary's Mansions, Paddington, London, W.2. Scient. chemist. Zürich "Polytechnicum" (1885–91); assistant to Professor Al. Classen; two years inorg. chemist (chiefly rare earths) in Germany; eighteen years manager of pottery works in Poland; research on kimmeridge oil; two years' work in connection with the Munitions Invention Department. (*Signed by*) Robert N. Lennox, E. Lawson Lomax, F. Mollwo Perkin, F. G. P. Remfry, C. K. Tinkler.

TOMS, HAROLD, "Brooklands," 33, Park Road, S. Wanstead, E.12. Lecturer (in chemistry, Walthamstow Technical School). Five years' training at the East Ham Technical College; two years at Islington Training College; four years at Birkbeck College—now doing Honours Year; and two years lecturer (chemistry and physics) at Walthamstow Technical School. (*Signed by*) George Senter, F. B. Thole, G. H. Martin, F. Barrow, H. D. K. Drew, E. D. Griffiths.

VINING, DUDLEY CLOETE, 206, Stanstead Road, Forest Hill, S.E.23. Research chemist. Having obtained a Fellowship for research of the Salters' Institute of Industrial Chemistry, I wish to receive the Chemical Society's publications and have access to its Library. (*Signed by*) George Senter, C. T. Bennett, G. T. Morgan, F. E. Matthews, William R. Grist.

WARDLAW, WILLIAM, The University, Edmund Street, Birmingham. Lecturer and demonstrator in chemistry. B.Sc.(Dunelm), 1913; M.Sc.(Dunelm), 1915; A.I.C., 1917; published with J. A. Smythe, Esq., D.Sc., Ph.D., in *Proc. Durham Philosophical Soc.*, 1914, "Oxidising Properties of Sulphur Dioxide"; 1913–1915, prize demonstrator in chemistry, Armstrong College, University of Durham; 1915–1918, chemist I.H.E. under D.I.H.E. (Birmingham Area); 1915 to present time, assstant lecturer and demonstrator in chemistry, University of Birmingham. (*Signed by*) Percy F. Frankland, P. Phillips Bedson, Frederick Challenger, C. E. Wood, W. E. Garner.

WHALE, ERNEST EDWARD, 167, Trinity Road, Wandsworth Common, S.W.17. Schoolmaster; lecturer in chemistry. B.Sc., London; I have been teaching chemistry in secondary and technical schools for about fifteen years, and am naturally anxious to keep in touch with the latest chemical developments. (*Signed by*) H. R. Ellis, Gerald Druce, A. Greeves, *A. N. Fitzgerald, Charles Dorée.*

WINGATE, DAVID, Ardmanoch, Tollcross, Glasgow. Analytical chemist. I was trained in Messrs. Tatlock and Thomson's laboratories from January, 1907, to October, 1913, and received theoretical training in the Royal Technical College, Glasgow; I have been chemist for all Messrs. Stewarts and

Lloyds' tube and engineering works since October, 1913. (*Signed by*) R. R. Tatlock, R. T. Thomson, Geo. Grant, Alex. W. McLaren, T. Greetham.

WOOD, ARTHUR SAMUEL, B.Sc. (1st Class Hons., London), A.I.C., 6, Walton Road, Sidcup, Kent. Lecturer in chemistry, Municipal Technical School, Birmingham. See Pope and Wood, *J.C.S.*, 1912, p. 1823; Thorpe and Wood, *J.C.S.*, 1913, pp. 276, 1569, 1579, 1586, 1601, and 1752; Price, Brazier, and Wood, *J. Soc. Chem. Ind.*, 1916, p. 147. (*Signed by*) Jocelyn Thorpe, T. Slater Price, A. E. Dunstan, F. B. Thole, Percy F. Frankland, James Bruce, F. C. Wood.

WOOD, THOMAS THORNE, 13, Chester Avenue, Southend-on-Sea, Essex. Chemist. Training in chemistry: six years at East Ham Technical College; fifteen months at East London College; two years evening classes at Sir John Cass Technical Institute; and one year evening classes at East Ham Technical College. Experience: four years chief assistant works chemist to British Explosives Syndicate, Pitsea, Essex, also in charge of laboratories; two years in charge of plant and laboratory at Messrs. Clayton Aniline Co., Ltd., Clayton, Manchester. (*Signed by*) W. Whyte, Robert Dodd, W. H. Bentley, A. Potter, *William M. Nichols.*

YARROW, GEORGE ERNEST, 8, First Avenue, Heaton, Newcastle-on-Tyne. Research chemist. B.Sc.(Chem.), Durham, 1913; Saville Shaw Medallist (Chem.), 1913; Johnston Research Scholar (Chem.), 1913–14; paper on "Compounds of Ferric Chloride with Ethers, etc.," *J.C.S.*, May, 1918; Associate of Institute of Chemistry. (*Signed by*) P. Phillips Bedson, F. C. Garrett, G. T. Moore, H. R. Le Sueur, Arthur W. Crossley.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (3):—

DRINKER, PHILIP, South Bethlehem, Pennsylvania, U.S.A. Chemical engineer. Graduate of Princeton University (1915), degree of B.S.; post-graduate of Lehigh University (1917), degree of Ch.E.; report to U.S. Bureau of Aircraft Production on "Aviation Chemistry" (1914–18), comprising over 5000 single space typewritten sheets. (*Signed by*) Edward C. Worden, Wm. Macnab, W. G. Emmett.

MACALLUM, ALEXANDER DOUGLAS, 243, College Street, Toronto, Canada. Research chemist, Synthetic Drug Co. B.A., University of Toronto, 1915; experimental chemist, Synthetic Drug Co., since 1915. (*Signed by*) A. Bruce Macallum, *Arthur Harden.*

WALL, EDWARD JOHN, 110, Brookline Avenue, Boston, Mass, U.S.A. Research chemist. Late professor of photography, Syracuse University; author of "Dictionary of Photography," "Carbon Printing" "Natural Color Photography"; four years editor, *Amateur Photographer*, Eng., and four years editor, *Photographic News*, Eng; eight years manufacturing photo-chemist. (*Signed by*) Alfred B. Hitchins.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, June 5th, 1919, at 8 p.m., Sir JAMES J. DOBBIE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society through the death of the following Fellows:

	Elected.	*Died.*
Thomas Fairley	May 15th, 1865.	Feb. 21st.
James Baird MacLachlan	May 4th, 1916.	May 25th.
Sir Boverton Redwood, Bart.	Jan. 18th, 1866.	June 4th.

Messrs. S. J. Hopkins, G. A. R. Kon, F. T. Stevenson, N. Singer, and H. G. Tribley were formally admitted as Fellows of the Chemical Society.

Certificates for election were read for the first time in favour of:

William Barnes, 29, Conway Road, Luton.
Frank Leslie Barrett, 46, Grantham Road, Horton, Bradford.
Harold Ward Dudley, 10, Lanark Mansions, Maida Vale, W.9.
Herbert William Gorbold, 45, Falmouth Avenue, Highams Park, E.4.
Sampson Manson Hing, Y.M.C.A., Tottenham Court Road, W.1.
Clive Newcomb, B.A., M.B., B.Ch., 48, Leigham Court Road, Streatham, S.W.16.
Isaac Sklar, 29, Clark Street, Stepney, E.1.
Colin Everett Spearing, Winslade, Eversfield Road, Reigate.
Ernest Edward Wallen, 8, Glade Street, Bolton.
Arthur Charles Vincent Weston, 24, Belsize Park Gardens, Hampstead, N.W.3.
Harold Bishop Williams, 6, Hamlet Road, Upper Norwood, S.E.19.

The following papers were read:

"An isotonic (isosmotic) apparatus for comparing molecular weights. Part I." By P. BLACKMAN.

"The 'active substance' in the iodination of phenols." By V. COFMAN.

"The chemistry of the glutaconic acids. Part XI. The occurrence of 1:3-addition to the normal form." By J. F. THORPE.

"The formation and reactions of imino-compounds. Part XIX. The chemistry of the cyanoacetamide and Guareschi condensations." By G. A. R. KON and J. F. THORPE.

Ordinary Scientific Meeting, Thursday, June 19th, 1919, at 8 p.m., Sir JAMES J. DOBBIE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	*Died.*
Samuel Godfrey Hall	Feb. 16th, 1899.	June 9th.
Walter Parker	Feb. 5th, 1917.	April 15th.
James Fleming Stark	Dec. 15th, 1870.	June 13th.

It was announced that a communication had been received from the Committee of the Van't Hoff Fund for the endowment of research in pure and applied chemistry. The amount from this fund available for distribution during 1920 is about £140.

A Committee, consisting of Professor A. F. Holleman (President), Professor S. Hoogewerff, Professor A. Smits, and Professor E. H. Büchner (Secretary), has been appointed to award grants. Applications should be sent before November 1st, 1919, by registered post, to "Het Bestuur der Koninkklyke Akademie van Wetenschappen: bestemd voor de Commissie van het 'Van't Hoff-fonds' Trippenhuis, Kloveniersburgwal, te Amsterdam." Every applicant is requested to submit a detailed account of the manner in which he proposes to expend the grant and to state the reasons for which he makes his application.

Papers embodying the results of the research may be published in any journal, but acknowledgment must be made of the source of the grant. Copies of papers containing the results of the research must be forwarded to the Committee.

Certificates were read for the first time in favour of:

Lawrence Eversley Campbell, B.Sc., 5, St. Matthew's Avenue, Surbiton.
Alan Ernest Gardiner, 21, Chestnut Road, W. Norwood, S.E.27.
Robert Grant, 24, Edward Street, Woollalua.
John Knaggs, B.Sc., South Street, Bridlington.
Charles Rose, B.Sc., 603, Chorley New Road, Horwich.

Certificates have been authorised by the Council for presentation to ballot under Bye-law I (3) in favour of:

Douglas Coghill, Kuala Lumpur, F.M.S.
Charles Edward Simithraaratchy, B.Sc., Trinity College, Kandy, Ceylon.

Messrs. H. E. Annett and A. J. Chapman were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared duly elected as Fellows:

Donald Bagley.
Edgar Beard, B.Sc.
Wilfrid Andrews Bell.
Alfred Randolph Campbell.
Algernon George Crossley.
Ananda Kishore Dás, M.A., B.Sc.
Manik Lal Dey, M.Sc.
Philip Drinker, B.S.
John Mouson Errington.
Archibald Wooster Frame.
John William Gardom.
Robert Stephen Glennie.
Cecil Godfrey.
Sidney Herbert Hadfield.
Harry Harper, B.Sc.
Herbert Hollings Jacques, B.Sc.
Louis Charles Kemp.
Herbert Joseph Seymour King, B.Sc.
Cyril Henry Stanley Kipping, M.A.
Morvan Lapworth, B.Sc.
Alexander Douglas Macallum, B.A.
Ernest Neil Macallum.
Denis Madden.
Owen Leonard Maund.
Brian Mead.
Rustom Jeejeebhoy Mistri.
Charles Jean Stanislas Van Overstraeten.
Arthur Pinkerton.
Sidney Owen Rawling, B.Sc.
John David Smith.
Sidney Albert Lewis Smith.
Cyril Richard William Stephenson, M.Sc.
Arnold Teichfeld.
Harold Toms.
Dudley Cloete Vining.
Edward John Wall.
William Wardlaw, M.Sc.
Ernest Edward Whale, B.Sc.
David Wingate.
Arthur Samuel Wood, B.Sc.
Thomas Thorne Wood.
George Ernest Yarrow, B.Sc.

The meeting was then adjourned and the Informal Meeting declared open.

THE LIBRARY.

The Library will be closed for Stocktaking from Monday, August 11th, until Saturday, August 23rd, 1919, inclusive.

LIST OF FELLOWS, 1919.

The List of Fellows for 1919 is now in active preparation, and changes of address received after July 31st cannot be included in it.

In order that the new list may be as complete as possible, those Fellows whose degrees and Christian names do not appear in full are requested to communicate them to the Assistant Secretary.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

ATACK, FREDERICK WILLIAM, and WHINYATES, LEONARD [Editors]. The Chemists' Year Book, 1918—19. 2 vols. London 1919. pp. 1146. 15*s.* net. (*Reference.*)

From the Publishers: Messrs. Sherratt and Hughes.

FINDLAY, ALEXANDER. Osmotic pressure. 2nd edition. London 1919. pp. xi+116. ill. 6*s.* net. (*Recd.* 3/6/19.)

From the Publishers: Messrs. Longmans, Green and Co.

RICHARDSON, CLIFFORD. Papers on asphalt and asphalt pavements. (Together with one by E. C. PAILLER on The differentiation of natural and oil asphalt.) 1912—1917. (*Reference.*)

From the Author.

SENTER, GEORGE. Outlines of physical chemistry. 7th edition. London 1919. pp. xx+432. ill. 6*s.* net. (*Recd.* 13/6/19.)

From the Author.

—— A text-book of inorganic chemistry. 5th edition. London 1919. pp. x+621. ill. 7*s.* 6*d.* net. (*Recd.* 13/6/19.)

From the Author.

II. *By Purchase.*

ABRAHAM, HERBERT. Asphalts and allied substances: their occurrence, modes of production, uses in the arts and methods of

testing. New York 1918. pp. xxv+606. ill. 25*s*. net. (*Recd.* 27/5/19.)

BEILSTEIN'S HANDBUCH DER ORGANISCHEN CHEMIE. Herausgegeben von der Deutschen Chemischen Gesellschaft, bearbeitet von BERNHARD PRAGER und PAUL JACOBSEN. Vol. I. Acyclische Kohlenwasserstoffe, Oxy- und Oxo-Verbindungen. 4th edition. Berlin 1918. pp. xxxv+983. (Two copies.)

BRACHVOGEL, JOHN K. Industrial alcohol, its manufacture and uses. Based on Dr. Max Maercker's "Introduction to distillation." With special chapters by CHARLES J. THATCHER. New York 1907. pp. xii+516. ill. 18*s*. net. (*Recd.* 21/5/19.)

LEWES, VIVIAN BYAM. The carbonisation of coal. A scientific review of the formation, composition and destructive distillation of coal for gas, coke and by-products. With an addition on recent developments by ALFRED BROADHEAD SEARLE. London 1918. pp. xiv+287. ill. 12*s*. 6*d*. net. (*Recd.* 6/6/19.)

OIL, PAINT AND DRUG REPORTER. Vol. 95, etc. New York 1919+. (*Reference.*)

PARRY, ERNEST JOHN. The chemistry of essential oils and artificial perfumes. Vol. 2. 3rd edition. London 1919. pp. [viii]+344. ill. 17*s*. 6*d*. net. (*Recd.* 16/6/19.)

SMITH, G. CARLTON. Trinitrotoluenes and mono- and di-nitrotoluenes: their manufacture and properties. London 1918. pp. vii+133. 8*s*. 6*d*. net. (*Recd.* 15/5/19.)

TROTMAN, SAMUEL RUSSELL, and THORP, E. L. The principles of bleaching and finishing of cotton. 2nd edition, revised. London 1918. pp. xii+347. ill. 21*s*. net. (*Recd.* 14/5/19.)

VAN NOSTRAND'S Chemical Annual. A handbook of useful data for analytical, manufacturing, and investigating chemists, chemical engineers, and students. Fourth issue, 1918. Edited by JOHN C. OLSEN and MAXIMILIAN P. MATTHIAS. London 1918. pp. xviii+778. 15*s*. net. (*Reference.*)

III. *Pamphlets.*

REILLY, JOSEPH. Industrial alcohol. Lecture delivered before the Royal Dublin Society, 19th Feb., 1919. Dublin 1919. pp. 36.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. First report of the Mine Rescue Research Committee. London 1918. pp. 55. ill.

STANSFIELD, ALFRED. The commercial feasibility of the electric smelting of iron ores in B.C. (*Bull.* No. 2, *Brit. Columbia, Dept. of Mines.*) Victoria 1919. pp. 95.

STEWART, ALAN WEST. The Crismer test for the detection of

foreign fat in butter, lard, &c. (From the *J. State Med.*, 1918, **26**.)

STOPES, MARIE C., and WHEELER, RICHARD VERNON. Monograph on the constitution of coal. (Based on a paper read before the London section of the Society of Chemical Industry.) London 1918. pp. 58. ill.

TILDEN, SIR WILLIAM AUGUSTUS. Books on chemistry. (*Birmingham Reference Library Lectures.*) London [1887]. pp. 55 + ii.

WASHINGTON, HENRY S. Italian leucitic lavas as a source of potash. (From *Met. and Chem. Engineering*, 1918, **18**.)

WHITE, ALFRED H., and RUE, JOHN D. Methyl alcohol and acetone as by-products of the soda pulp industry. (From *Paper*, 1917, **19**.)

WILLIAMSON, E. D. The effect of strain on heterogeneous equilibrium. (From the *Physical Rev.*, 1917, **10**.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, November 6th, 1919, at 8 p.m., Sir JAMES J. DOBBIE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT announced that the Society had lost, through death, the following Fellows:

Honorary and Foreign Member.	Elected.
Antoine Paul Nicolas Franchimont	Jan. 20th, 1898.

Fellows.	Elected.	Died.
Herbert Anderson	Feb. 21st, 1895.	July 17th, 1919.
Richard Blenkinsop	April 30th, 1902.	Dec. 9th, 1918.
John Richard Brooke	May 3rd, 1900.	July 9th, 1919.
Adrian John Brown	May 4th, 1876.	July 2nd, 1919
William James Cousins	Dec. 17th, 1885.	Aug. 1st, 1919.
Walter Henry Dixon	Dec. 5th, 1912.	Sept. 22nd, 1919.
William Lofland Dudley	Dec. 4th, 1890.	Sept. 8th, 1914.
Owen Charles Edwards	May 2nd, 1918.	Oct. 29th, 1918.
Harold Cecil Greenwood	May 4th, 1916.	Nov. 4th, 1919.
Augustus George Vernon Harcourt	Feb. 3rd, 1859.	Aug. 23rd, 1919.
Henry Owen Huskisson	Mar. 21st, 1861.	June 24th, 1919.
George Frederic Kendall	Dec. 18th, 1884.	Jan. 28th, 1919.
Thomas Morison Maben	Feb. 18th, 1915.	July 4th, 1919.
Arthur Sampson Napier	Mar. 5th, 1874.	
Francis Reginald Power	Feb. 21st, 1884.	July 10th, 1919.
Sir Peter Wyatt Squire	May 4th, 1882.	Sept. 16th, 1919.
John Charles Umney	Feb. 16th, 1893.	Oct. 9th, 1919.
Elwyn Waller	Dec. 5th, 1878.	
Christopher Joseph Whittaker	June 15th, 1899.	July 17th, 1918.

Messrs. H. T. S. Britton, A. G. Crossley, S. F. W. Crundall, V. P. Hart, and E. Shepherd were formally admitted as Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

George James William Anderson, 2, Wickham Road, Brockley, S.E.4
Francis Arnall, B.Sc., 153, St. John's Hill, S.W.11.
Donald Hugh Bangham, B.A., 86, Bryn Road, Swansea.
Charles Oliver Barber, B.Sc., 124 Portland Road, Nottingham.
Arthur Neal Barker, 69, St. Margaret's Road, E. Twickenham.
Walter Cyril Batty, B.Sc., 42, Parrott Street, Newington, Hull.
Harold William Bausor, M.A., De Freville Lodge, De Freville Avenue, Cambridge.
John Broadhouse Herbert Beards, The Dene, Mount Road, Tettenhall Wood, Wolverhampton.
Arthur George Vale Berry, Ardenconnel, Warwick Road, Sutton.
Eric Clifford Berry, Stone Cross, Shelley, Huddersfield.
Philip Blenkinsop, Deacon's Court, Elstree, Herts.
John Scott Walker Boyle, M.A., B.Sc., Lingfield, Tayport, Fife.
Thomas Kerfoot Brownson, B.A., M.Sc., 19, Priory Gardens, Highgate, N.6.
Philip Cecil Bull, 27, Launceston Place, Kensington, W.8.
Frederick William Bunyan, Heroult, Shasta Co., California, U.S.A.
Stanley Lees Burrows, 8, Claremont Terrace, Bradford.
Sydney Raymond Carter, M.Sc., 107, Varna Road, Edgbaston, Birmingham.
Herbert Grey Catterall, 482, Bolton Road, Radcliffe, Manchester.
Harry Cooper, c/o Messrs. Smith Stanistreet and Co., Ltd., Calcutta.
Angus Fairthorne Core, M.Sc., Groombridge House, Withington, Manchester.
Colin Granville Core, M.Sc., Groombridge House, Withington, Manchester.
Arthur Crabtree, Ashfield, Whitkirk, near Leeds.
Alexander Cronin, 44, Old Canterbury Road, Lewisham, Sydney, N.S.W.
Arthur James Dando, B.Sc., 124, Roman Road, E.3.
Rasik Lal Datta, D.Sc., 78, Manicktola Street Calcutta, India.
Frederick William Francis Day, Rubber Growers' Association, Kuala Lumpur, F.M.S.
William Percy Dean, 1, Beaufort House, Beaufort Street, Chelsea, S.W.3.
William Doran, B.Sc., 32, Rufford Road, Fairfield, Liverpool.
Leonard Alfred Downing, 17, Carholme Road, Forest Hill, S.E.23.
Oliver Coligny de Champfleur Ellis, B.Sc., 134A, Denmark Road, Greenheys, Manchester.
Gerald Clifton Evans, Merlin, Banbury Road, Stratford-on-Avon.
John Gunter Fairgrieve, Sherwood, Bellshill Road, Uddingston.
Henry Ruchet Fairweather, M.A., Copthorne, Richmond Road, Sutton Coldfield, Birmingham.
Peter Fenton, The Ore Pharmacy, Cardenden, Fife.
Charles Ferguson, 32, Margaret Street, Greenock.
Kensaku Fukuma, Pharmaceutical Institute, Imperial University, Kyoto, Japan.
Jnanendra Chandra Ghosh, D.Sc., 21, Cromwell Road, S.W.7.
Lionel Felix Gilbert, B.Sc., Frogmore, Beaconsfield.
William Henry Gough, B.Sc., 120, Boleyn Road, Forest Gate, E.7.
Hugh Graham, B.Sc., 125, Wellesley Avenue, Belfast.
John Groves, Llanvaches, Somerton Road, Newport, Mon.
Louis Jean Henri Hackspill, D.-ès-Sc., 14, rue Silbermann, Strasbourg.
Wilfred Harrison, 151, Wigan Road, Ashton-in-Makerfield, Newton-le-Willows.

Frank William Helsby, 38, Guildford Street, Russell Square, W.C.1.
Douglas Raoul Hall Hepsworth, 431, Holloway Road, N.7.
Edgar William Holmes, 4, Massey Street, St. George's Road, Hull.
Shinkichi Horiba, c/o The Sumitomo Bank, Ltd., 87, Gracechurch Street, E.C.3.
Edwyfed Wynne Hughes, M.Sc., Llys Elen, Pen-y-groes, N. Wales.
Christopher Kelk Ingold, B.Sc., 3, Kelbourne Street, N. Kelvinside, Glasgow.
David Charles Jones, M.Sc., 4, Primrose Terrace, St. Michael's Street, Shrewsbury.
Julius Jung, 14, Bancroft Road, E.1.
Abdus Samad Khan, M.Sc., Patna College, Bankipore, India.
Leslie Gordon Lawrie, Field View, Stoke Prior, Bromsgrove.
Norman Stuart Lawson, 69, St. George's Road, S.W.1.
Clement Joseph Leaper, Nun's Island, Galway.
William Vernon Lloyd, B.Sc., Keeston, Holland Road, Weymouth.
Ashley Gordon Lowndes, M.A., Waverley, Cuckfield, Haywards Heath.
Ernest Joseph Lush, B.A., 29, St. Peter's Square, Hammersmith, W.6.
Robert McCall, B.A., 23, Bellevue Crescent, Ayr.
Eric Julius Miller, 7, Buckingham Gardens, Perambore Barracks, Madras, India.
Aristide Moray, 67, Talgarth Road, W. Kensington, W.14.
Arthur Mortimer, 9, Leeds Road, Harrogate.
Charles Morton, 38, Larkhall Rise, Clapham, S.W.4.
Jnanendra Nath Mukherjee, M.Sc., The University, Calcutta, India.
Albert Nash, Holly House, Wath-on-Dearne, Rotherham.
Samuel Essex Neal, 48, Auckland Avenue, Hull.
Lewis Neaverson, Clough Edge, Halifax Old Road, Huddersfield.
Arthur Matthew O'Brien, Messrs. Anglo-Persian Oil Co., Ltd., Abadan, Persian Gulf.
Humphrey Paget, B.A., 7, Palace Mansions, Lambeth Road, S.E.1.
Kantilal C. Pandya, Agra, India.
James William Porteous, Grange Hill, Bishop Auckland.
James Davidson Pratt, M.A., B.Sc., 3, Leinster Gardens, W.2.
Ernest Leslie Randall, 6, Belgrave Terrace, New North Road, Huddersfield.
George Smith Sayner, Parkhurst, Queen's Road, Richmond, Surrey.
James Lang Scott, Twynholm, Bramley, Surrey.
Laurence Henry Sensicle, B.Sc., 73, Dumfries Street, Treorchy, Rhondda.
Douglas Oswald Shiels, B.Sc., Hawthorn, Melbourne, Victoria, Australia.
Wallace Frank Short, B.Sc., 11, Brighton Grove, Rusholme, Manchester.
Leon Rossiter Dalglish Stahle, Gwandalan, Muir Street, Hawthorn, Victoria, Australia.
James Taylor, 2, Nibthwaite Road, Harrow.
Cyril Kenwyn Walter Thorn, B.Sc., 72, Paris Street, Exeter.
Ernest Walls, The Garthe, Percival Road, Clifton, Bristol.
Noel Stanley Walls, B.Sc., 45, Platt Lane, Hindley, Lancs.
William Nelson Watson, 41, Woodwynd, Kilwinning, Ayrshire.
Narbheshanker Amarji Yajnik, M.A., Purani Anarkali, Lahore, India

Certificates have been authorised by the Council for presentation to ballot under Bye-Law I. (3) in favour of:

Ernest Roadley Dovey, Government Laboratory, Hong Kong.
Tarapada Ghosh, B.Sc., P.O. Tala, District Khulna, Bengal, India.
Brunel Robert Law, Birralee, Sussex Street, Brighton, Victoria, Australia.
Edward Sandford Lord, B.A., Gladstone, Manitoba, Canada.
Eugene Charles Prins, Kilkade, Zeehaven, Dordrecht, Holland.
Maxwell Williamson Young, 11, Burnell Avenue, Wellington, N.Z.

The following papers were read:

"Equilibria across a copper ferrocyanide and an amyl alcohol membrane." By F. G. Donnan and W. E. Garner.

"The peroxides of bismuth." By R. R. Le G. Worsley and P. W. Robertson.

"The properties of ammonium nitrate. Part I. The freezing point and transition-temperatures." By T. M. Lowry and R. G. Early.

"Some 1:3-benzodiazolearsinic acids and their reduction products." By R. R. Baxter and R. G. Fargher.

Ordinary Scientific Meeting, Thursday, November 20th, 1919, at 8 p.m., Sir James J. Dobbie, D.Sc., F.R.S., President, in the Chair.

The President referred to the death, which took place on November 15th, of our distinguished Honorary and Foreign Member, Professor Alfred Werner, of Zürich, who was elected an Honorary and Foreign Member on June 5th, 1913, and also to the death, on October 1st, of Mr. John Holmes, who was elected a Fellow on March 4th, 1897.

Mr. E. J. Sterne was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

Ernest Edward Ayling, Argyle, Woodthorpe Road, Ashford, Middlesex.
John Etters Beck, Glenmore, Broughbridge Road, Knaresborough, Yorks.
Herbert Brunt, 43, Scarisbrick New Road, Southport.
Harold Buckley, 45, Ainger Road, Primrose Hill, N.W.3.
Arthur William Freeston Chatfield, B.A., 15, Viewforth, Edinburgh.
Laurence William Codd, Organic Chemical Laboratory, South Parks Road, Oxford.
John Outram Cutter, B.Sc., 185, Court Road, Barry, Glam.

Cedric Arthur Vincent-Daviss, 371, Gillott Road, Edgbaston, Birmingham.
Matthewman, Henry Donald, B.A., Quarry Hill, Malsgate, Cumberland.
Thomas Hartley, 144, Gleneagle Road, Streatham, S.W.16.
Walter Edmund Merry, 138, Greenvale Road, Eltham, S.E.9.
Stanley A. Mumford, Runnymede, Wellington Road, Enfield.
John Ralph Nicholls, B.Sc., 1A, Hillfield Gardens, Muswell Hill, N.10.
Mortimer William O'Donohoe, 56, Claverdale Road, Elm Park, Brixton, S.W.2.
Sydney Glenn Preston Plant, B.A., Organic Chemical Laboratory, South Parks Road, Oxford.
Norman Strafford, 17, Delaunays Road, Crumpsall, Manchester.
Frederick James Thorneycroft, B.Sc., Birkbeck College, Breams Buildings, E.C.4.
George Price Trasler, B.Sc., 123, Capel Road, Forest Gate, E.7.
George Frederic White, B.Sc., 4, Everaleigh Road, East Ham, E.6.
Ernest James Williams, B.Sc., 8, Oakfield Terrace, Gosforth, Newcastle-upon-Tyne.

The meeting was then adjourned and the Informal Meeting declared open.

LECTURE.

At the Ordinary Scientific Meeting to be held on Thursday, December 18th, at 8 p.m., Professor J. Walker, LL.D., F.R.S., will deliver a Lecture entitled "War Experiences in the Manufacture of Nitric Acid and the Recovery of Nitrous Fumes."

RESEARCH FUND.

A meeting of the Research Fund Committee will be held in December next. Applications for grants, to be made on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, W.1, must be received on or before Monday, December 1st, 1919.

All persons who received grants in December, 1918, or in December of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned to the Assistant Secretary by Monday, December 1st.

The Council wish to direct attention to the fact that the income arising from the donation of the Worshipful Company of Goldsmiths is to be more or less especially devoted to the encouragement of research in inorganic and metallurgical chemistry. Furthermore, that the income due to the sum accruing from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the coal-tar and allied industries.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BARNETT, EDWARD DE BARRY. Explosives. London 1919. pp. xv+241. ill. 12*s*. 6*d*. net. (*Recd*. 8/7/19.)
From the Publishers: Messrs. Baillière, Tindall and Cox.

CALVERT, ALBERT FREDERICK. Salt and the salt industry. London [1919]. pp. vii+151. ill. 2*s*. 6*d*. net. (*Recd*. 3/7/19.)
From the Publishers: Sir Isaac Pitman and Sons.

THE CHEMICAL AGE. A weekly journal devoted to industrial and engineering chemistry. Vol. I., etc. London 1919+.
From the Publishers: Messrs. Benn Bros.

EGYPT, MINISTRY OF THE INTERIOR. Department of Public Health. Reports and notes of the Public Health Laboratories, Cairo. Cairo 1918. pp. 111. ill. (*Recd*. 6/11/19.)
From the Department.

HALE, ARTHUR JAMES. The manufacture of chemicals by electrolysis. London 1919. pp. xi+80. ill. 6*s*. net. (*Recd*. 7/10/19.) From the Publishers: Messrs. Constable and Co.

HENRI, VICTOR. Études de photochimie. Paris 1919. pp. vii+218. ill. (*Recd*. 30/6/19.) From the Author.

JAEGER, F. M. Lectures on the principle of symmetry and its application in all natural sciences. London 1917. pp. xii+333. ill. (Second copy.) (*Recd*. 16/10/19.)
From the Publishers: Cambridge University Press.

JOURNAL OF GENERAL PHYSIOLOGY. Edited by JACQUES LOEB and W. J. V. OSTERHOUT. Vol. I., etc. Baltimore 1918+.
From the Publishers: The Rockefeller Institute for Medical Research.

LECAT, MAURICE. La tensione de vapeur des mélanges de liquides. L'azéotropisme. Part I. Bruxelles 1918. pp. xii+319. *Fr*.45. (*Recd*. 30/9/19.) From the Author.

MORGAN, J. D. Principles of electric spark ignition in internal combustion engines. London [1919]. pp. [vii]+88. ill. 8*s*. 6*d*. net. (*Recd*. 19/9/19.)
From the Publishers: Messrs. Crosby Lockwood and Son.

PEACOCK, DAVID HENRY. Joseph Priestley. London 1919. pp. 63. ill. 2*s*. net. (*Recd*. 22/7/19.) From the Author.

PILCHER, RICHARD B. The profession of chemistry. London 1919. pp. xiv+199. 6*s*. 6*d*. net. (*Recd*. 29/10/19.)
From the Publishers: Messrs. Constable and Co.

PRIDEAUX, EDMUND BRYDGES RUDHALL. The theory and use

of indicators. An account of the chemical equilibria of acids, alkalies, and indicators in aqueous solutions, with applications. London 1917. pp. vii+375. ill. (Second copy.) 12*s*. 6*d*. net. (*Recd*. 26/6/19.)

From the Publishers: Messrs. Constable and Co.

Russell, Edward John. A student's book on soils and manures. 2nd edition, revised and enlarged. Cambridge 1919. pp. xii+240. ill. 6*s*. 6*d*. net. (*Recd*. 22/7/19.)

From the Publishers: Cambridge University Press.

Spencer, James Frederick. The metals of the rare earths. London 1919. pp. x+279. ill. 12*s*. 6*d*. net. (*Recd*. 24/6/19.)

From the Publishers: Messrs. Longmans, Green and Co.

Stevens, Henry Potter. The paper mill chemist. 2nd revised and enlarged edition. London 1919. pp. viii+317. ill. 10*s*. 6*d*. net. (*Recd*. 26/6/19.) From the Author.

II. *By Purchase.*

Arrhenius, Svante. Lehrbuch der Elektrochemie. Translated from the Swedish by Hans Euler. Leipzig 1915. pp. vi+305. ill. (*Recd*. 6/11/19.)

Bersch, Josef (Editor). Chemisch-technisches Lexikon. Eine Sammlung von mehr als 17,000 Vorschriften und Rezepten für alle Gewerbe und technischen Künste. 3rd edition. Wien n.d. pp. [vi]+951. ill. (*Reference*.)

British Association for the Advancement of Science. Second report on colloid chemistry and its general and industrial application. London 1919. pp. 172. 1*s*. 6*d*. net. (*Recd*. 28/7/19.)

Cushman, Allerton S., and Gardner, Henry A. The corrosion and preservation of iron and steel. New York 1910. pp. xx+373. ill. 20*s*. net. (*Recd*. 2/9/19.)

Deutsche Chemische Gesellschaft. Literatur-Register der organischen Chemie. Edited by Robert Stelzner. Vol. 2. 1912—1913. Braunschweig 1917—1919. pp. xl+1672. (*Reference*.)

Ditmar, Rudolf. Die Technologie des Kautschuks. Wien 1915. pp. viii+600. ill. (*Recd*. 6/11/19.)

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Ellis, Carleton. The hydrogenation of oils, catalyzers and catalysis, and the generation of hydrogen and oxygen. 2nd edition. London 1919. pp. xvii+767. ill. 36*s*. net. (*Recd*. 16/10/19.)

ESCALES, RICHARD. Die Explosivstoffe mit besonderer Berücksichtigung der neueren Patente. 7 vols. Leipzig 1905—1917. (*Recd.* 7/7/19.)

GUMMI-ZEITUNG. Fachblatt der Gummi-, Guttapercha- und Asbestindustrie. Year 33, etc. Berlin 1919+. (*Reference.*)

HAUSBRAND, E. Die Wirkungsweise der Rektifizier- und Destillier-Apparate mit Hilfe einfacher mathematischer Betrachtungen. 3rd edition. Berlin 1916. pp. vii+202. ill. (*Recd.* 6/11/19.)

—— Verdampfen, Kondensieren und Kühlen. Erklärungen, Formeln und Tabellen für den praktischen Gebrauch. 6th edition. Berlin 1918. pp. xix+540. ill. (*Recd.* 6/11/19.)

HENDRICK, ELLWOOD. Everyman's chemistry. The chemist's point of view and his recent work told for the layman. London 1918. pp. x+319. 8*s.* 6*d.* net. (*Recd.* 14/7/19.)

HERZFELD, J. Das Färben und Bleichen. Vol. 3. Die Praxis der Färberei unter Berücksichtigung der Appretur. 2nd edition, by BERTHOLD WUTH. Berlin 1916. pp. xi+506. ill. (*Recd.* 6/11/19.)

HJELT, EDV. Geschichte der organischen Chemie von ältester Zeit bis zur Gegenwart. Braunschweig 1916. pp. xii+556. ill. (*Recd.* 6/11/19.)

HOFMAN, HEINRICH O. Metallurgy of lead. London 1918. pp. xiv+664. ill. 30*s.* net. (*Recd.* 21/6/19.)

KÖHLER, HIPPOLYT. Die Industrie der Cyanverbindungen, ihre Entwickelung und ihr gegenwärtiger Stand. (N. Handb. der chem. Tech., VIII.) Braunschweig 1914. pp. xiv+200. ill. (*Recd.* 20/8/19.)

LEWIS, WILLIAM CUDMORE MCCULLAGH. A system of physical chemistry. 2nd edition. 3 vols. London 1918—1919. pp. xii+494, vi+403, viii+209. ill. 37*s.* 6*d.* net. (*Recd.* 23/6/19.)

RÜDISÜLE, A. Nachweis, Bestimmung und Trennung der chemischen Elemente. 5 vols. Bern 1913—1918. pp. xl+543, xl+623, xlviii+762, xlviii+761, lxxxii+1343. (*Recd.* 6/11/19.)

SCHRÖDER, HUGO. Die Schaumabscheider als Konstruktionsteile chemischer Apparate, ihre Bauart, Arbeitsweise und Wirkung. (Monographien zur chemischen Apparatur. Heft 1.) Leipzig 1918. pp. 160. ill. (*Recd.* 6/11/19.)

SPONS' Workshop receipts for manufacturers and scientific amateurs. 4 vols. London 1917. pp. viii+532, viii+544, viii+528, viii+544. ill. 30*s.* net. (*Recd.* 23/10/19.)

TREADWELL, FREDERICK PEARSON. Analytical chemistry. Volume II. Quantitative analysis. Authorised translation from

the German by WILLIAM T. HALL. 4th edition. London n.d. pp. xi+926. ill. 16*s.* 6*d.* net. (*Recd.* 20/8/19.)

WALTER, JOHANN. Erfahrungen eines Betriebsleiters. [Reprint of "Aus der Praxis der Anilinfarbenfabrikation."] Leipzig 1903. pp. vii+328. ill. (*Recd.* 29/7/19.)

WICHELHAUS, H. Sulfurieren, Alkalischmelze der Sulfosäuren, Esterifizieren. (Chem. Tech. in Einzeldarstellungen.) Leipzig 1911. pp. vi+127. ill. (*Recd.* 27/10/19.)

ZEITSCHRIFT FÜR DAS GESAMTE SCHIESS- UND SPRENGSTOFFWESEN. Year 14, etc. München 1919+. (*Reference.*)

ZEITSCHRIFT FÜR SPIRITUSINDUSTRIE. Year 42, etc. Berlin 1919+. (*Reference.*)

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, DECEMBER 4TH, 1919

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ANDERSON, GEORGE JAMES WILLIAM, 2, Wickham Road, Brockley, S.E.4. Works chemist of the South Metropolitan Gas Co. Diplom-Engineer, Dr. Ing. (Hanover). Publications: *Gas World, Journal of the Society of Chemical Industry, Journal für Gasbeleuchtung, Zeitsch. f. angew. Chemie, Zeitsch. für analytische Chemie.* (*Signed by*) Francis V. Darbishire, C. J. D. Gair, H. Hollings, R. Lessing, James W. McBain, E. V. Evans, *William A. Bone.*

ARNALL, FRANCIS, 153, St. John's Hill, London, S.W.11. Lecturer in chemistry. B.Sc. (London). For nearly three years staff works chemist to the Ministry of Munitions, latterly in charge of all "shift process work" at H.M. Factory, Craigleith, Edinburgh; now lecturer in chemistry to South-Western Polytechnic Institute, London, S.W.3. (*Signed by*) J. B. Coleman, J. C. Crocker, James Walker, Alex. C. Cumming, F. H. Lowe.

BANGHAM, DONALD HUGH, B.A., 86, Bryn Road, Swansea. Lecturer in chemistry at University of Manchester. Late Natural Science scholar (1912) of Jesus College, Oxford. First class honours in Natural Science (Chemistry) at Oxford University (1919). (*Signed by*) H. B. Dixon, Arthur Lapworth, F. P. Burt, W. K. Slater, Henry Stephen.

BARBER, CHARLES OLIVER, 124, Portland Road, Nottingham. Technical clerk. B.Sc. (War), London University, November, 1917. Statistical section of the Chemical Department, South Metropolitan Gas Company, 709, Old Kent Road, S.E. I desire, through the Society, to keep in touch with modern chemistry for my work, and to have the use of the library. (*Signed by*)

J. E. Coates, T. Slater Price, F. Stanley Kipping, Stanley J. Green, E. V. Evans.

BARKER, ARTHUR NEAL, 69, St. Margaret's Road, E. Twickenham, Middlesex. Student; taking Hons. B.Sc. (Chem.) course at Birkbeck College, Chancery Lane, E.C. Spent one year as assistant to Mr. W. H. Simmons, B.Sc., F.I.C., in research upon bleaching and refining various waxes, and two years with R.N. Experimental Section on poison-gas and smoke-screens. (*Signed by*) George Senter, S. Sugden, F. Barrow, W. H. Simmons, S. P. Kipping.

BARNES, WILLIAM, 29, Conway Road, Luton. Manufacturing chemist and chemical merchant. Minor examination of the Pharmaceutical Society, also three years in laboratory under A. Kitchin, Esq. (deceased), F.I.C., Whitehaven, Cumberland. (*Signed by*) John B. Hoblyn, H. V. A. Briscoe, Ernest J. Parry, *A. M. Bailey, William G. Wagner.*

BARRETT, FRANK LESLIE, 46, Grantham Road, Horton, Bradford, Yorks. Research chemist, The Tootal Broadhurst Lee Co., 56, Oxford Street, Manchester. Educated Hanson School, Bradford; Technical College, Bradford; Royal College of Science, London. Associate of Institute of Chemistry (A.I.C.); diploma in Chemistry and Dyeing, Bradford, 1912; City and Guilds and Textile Institute, silver and bronze medallist in Dyeing and Colour Chemistry, 1912–1913; Royal Scholar at R.C.S. (broke R.C.S. course to join Army); Corporal R.E. (B.E.F.), 1915–1917; research chemist, Royal Arsenal, Woolwich, 1917–1919. Publication: "Constitution of phenolphthalein and its alkali salts," Fort and Barrett, *Proc. Chem. Soc.*, 1913, **29**, 270. (*Signed by*) W. Howieson Gibson, A. Forster, S. Sugden, Harold J. Page, Harold Davies.

BATTY, WALTER CYRIL, 42, Parrott Street, Newington, Hull. Head of Chemistry Department, Craven Street Secondary School, Hull. Training: University College, Nottingham, 1905–7. Degree: B.Sc., London University. Experience: Lecturer at Craven Street, 1915–19. (*Signed by*) Harry Thompson, T. Luxton, Geo. H. Appleyard, J. W. Pearson, W. G. Martin.

BAUSOR, HAROLD WILLIAM, M.A. (Cantab.). De Freville Lodge, De Freville Avenue, Cambridge. Teacher of Chemistry. Author and joint author of text-books of chemistry: "Chemical Calculations," "An Introductory Course of Chemistry," etc. During the War acted as research chemist under the Ministry of Munitions. (*Signed by*) W. J. Pope, Charles T. Heycock, W. H. Mills, C. S. Gibson, F. W. Dootson.

BEARDS, JOHN BROADHOUSE HERBERT, 59, The Grove, Hammersmith. Analytical chemist, Royal Arsenal, Woolwich. Three years' training in chemistry, physics, mathematics at Birmingham University. Passed Intermediate B.Sc., and part of final B.Sc.; two years' experience as teacher of chemistry at Handsworth Grammar School and Wolverhampton; sixteen months' experience as analytical chemist at H.M. Factory, Oldbury; six months' experience as analytical chemist at Woolwich Arsenal. (*Signed by*) T. Hedley Barry, E. Francis Smith, H. T. F. Rhodes, S. C. Atkinson, *A. H. M. Muter.*

BERRY, ARTHUR GEORGE VALE, "Ardenconnel," Warwick Road, Sutton, Surrey. Chemist. 1911–19, chief chemist to the late Sir Boverton Redwood, Bart., and Robert Redwood, Esq., F.C.S.; 1917, chief chemist to the Petroleum Research Department, Ministry of Munitions; 1918, chief chemist to the Mineral Oil Production Department, Ministry of Munitions; seventeen years' experience in the technology of petroleum, coal tar, wood tar, shale oil, and cannel oil; relieving gas examiner under the authority of London County

Council and Metropolitan Gas Referees; Member of Institution of Petroleum Technologists. (*Signed by*) Robert Redwood, A. E. Dunstan, T. P. Hilditch, F. B. Thole, Andrew Campbell, Frank Clowes.

BERRY, ERIC CLIFFORD, "Stone Cross," Shelley, near Huddersfield. Chemist. First class bronze medallist, City and Guilds of London Institute in "Manufacture of Metallurgical Coke and By-Products." Five years' experience in this industry with Messrs. Stringer and Son., Ltd., Clayton West, near Huddersfield; also nine months' nitric acid manufacture, Messrs. J. W. Leitch and Co., Huddersfield. (*Signed by*) J. B. Coleman, F. H. Lowe, J. C. Crocker ,Hamilton Wingate, *A. E. Dunstan.*

BLENKINSOP, PHILIP, Deacon's Court, Elstree. Chemical manufacturer. Director of May and Baker, Ltd., manufacturing chemists. Studied chemistry under Prof. H. E. Armstrong at the City and Guilds Institute. (*Signed by*) Arthur J. Ewins, Charles Gilling, R. W. E. Stickings, A. Haythornthwaite, G. Newbery, Harold J. Cross.

BOYLE, JOHN SCOTT WALKER, Lingfield, Tayport, Fifeshire. Lecturer in Chemistry, University College, Dundee. M.A. (St. Andrews), with first-class honours in Mathematics and Natural Philosophy; B.Sc. (St. Andrews), with special distinction in Chemistry. Army service, 1914–1919. (*Signed by*) Alex. McKenzie, John Foggie, J. C. Irvine, W. N. Haworth, G. Robertson.

BROWNSON, THOMAS KERFOOT, 19, Priory Gardens, Highgate, N.6. Research chemist. B.Sc. (Manc.), honours in chemistry; M.Sc. (Manc.); B.A. (Cantab.); research in chemistry; A.I.C. (*Signed by*) L. H. Parker, J. A. Harker, Henry Terrey, W. B. Tuck, J. N. Collie.

BULL, PHILIP CECIL, D.S.O., 27, Launceston Place, Kensington, W.8. Demonstrator in chemistry, the Royal College of Science. A.R.C.Sc.; A.I.C.; demonstrator in chemistry at the Royal College of Science. (*Signed by*) H. B. Baker, P. W. Robertson, A. T. King, Arthur A. Eldridge, H. F. Harwood, James C. Philip.

BUNYAN, FREDERICK WILLIAM, Heroult, Shasta Co., California, U.S.A. Chief chemist, Noble Electric Steel Co., Heroult, Cal., U.S.A. Formerly testing chemist, Southern Pacific Railroad System, U.S.A.; works chemist, American Magnesite Co., Porterville, Cal., U.S.A.; chief, Industrial Department, E. de F. Central do Brazil (Central Railroad of Brazil); secretary and assistant, Industrial Department, Leopoldine Ry. E., Ltd., Brazil; student, Finsbury Technical College (under Meldola). (*Signed by*) F. H. Streatfeild, O. Silberrad, B. H. Bowles, *Herbert Edward Law, George Dean.*

BURROWS, STANLEY LEES, 8, Claremont Terrace, Bradford. Works chemist, Hawick Tweed and Hosiery Manufacturers' Association; lecturer in chemistry, bleaching and dyeing, Hawick Technical Institute; higher certificate, chemistry and dyeing, Bradford Technical College; treble medallist, City and Guilds; nine years as assistant to W. Leach, Esq., F.C.S., in laboratory, Woolcombers, Ltd.; three years as senior assistant to S. M. Sutcliffe, Esq., F.C.S., in laboratory, Brookes Chemicals, Ltd. (*Signed by*) Walter Leach, S. M. Sutcliffe, Barker North, Saml. F. Stell, W. L. Thomas, John C. Oxley, B. A. Burrell.

CAMPBELL, LAWRENCE EVERSLEY, 5, St. Matthew's Avenue, Surbiton, Surrey. Research chemist. Trained at University College, London, 1906–1910. B.Sc. (London); F.I.C. Rubber research chemist, Department of Agriculture, Ceylon, 1913–1917; research on technology of production of plantation rubber. (*Signed by*) W. B. Tuck, Samuel Smiles, J. N. Collie, *H. J. Evans, Henry Terrey.*

CARTER, SYDNEY RAYMOND, M.Sc., 107, Varna Road, Edgbaston, Birmingham.

Chemistry lecturer, University of Birmingham. M.Sc. (Birmingham); A.I.C.; Dipl. Ing. (Karlsruhe); Priestley Research Scholar (two years) under Prof. P. F. Frankland, F.R.S.; two years under Prof. G. Bredig at Technische Hochschule, Karlsruhe. Published work: "Position Isomerism and Optical Activity," Frankland, Carter, and Adams, *J.C.S. Trans.* (1912), **101**, 2479; "Synthesis of Formic Acid under Pressure," Bredig and Carter, *Berichte* (1914), **47**, 541; "Analysis of Chlorobenzene Mixtures," Frankland, Carter and Webster, *J.S.C. Ind.* (1919), **38**, 153T. Assistant lecturer and demonstrator at University of Birmingham from 1915 to the present time. During the war assisted in researches of a confidential nature, also supervised the analysis of tar and benzol for the Midland Area under Prof. Frankland, F.R.S., on behalf of the Ministry of Munitions. (*Signed by*) Percy F. Frankland, Frederick Challenger, T. Slater Price, J. E. Coates, A. Parker.

CATTERALL, HERBERT GREY, 482, Bolton Road, Radcliffe, near Manchester. Works chemist. Being engaged in chemical research on the production of oleines, stearines, glycerine, etc., I wish to keep in touch with all the modern scientific discoveries. (*Signed by*) Charles Hy. Martin, Geo. Johnson, John Allan, F. S. Sinnatt, *Jas. Grant.*

COOPER, HARRY, 16, King Edward Avenue, Dartford, Kent. Pharmaceutical chemist. Demonstrator, London College Pharmacy; assistant analyst, Burroughs Wellcome and Co., chemical and pharmaceutical manufacturers. (*Signed by*) W. H. Taylor, Frederic H. Lees, A. L. Bacharach, S. Smith, *W. T. Grice.*

CORE, ANGUS FAIRTHORNE, M.Sc., Groombridge House, Withington, Manchester. Research assistant in chemistry, University of Manchester; M.Sc. by research, University of Manchester; for two years member of the High Explosives Staff (for the Manchester Area) of the Inspection Department, Royal Arsenal; carried out researches under Prof. H. B. Dixon for the Admiralty and for the Alcohol Motor-fuel Committee. (*Signed by*) H. B. Dixon, Arthur Lapworth, F. P. Burt, W. K. Slater, Colin Campbell, F. Fairbrother, W. J. Jones, A. Parker.

CORE, COLIN GRANVILLE, M.Sc., Groombridge House, Withington, Manchester. Research assistant in chemistry, University of Manchester. M.Sc. by research, University of Manchester; for two years member of the High Explosives Staff (for the Manchester Area) of the Inspection Department, Royal Arsenal; carried out researches under Prof. H. B. Dixon for the Admiralty and for the Alcohol Motor-fuel Committee. (*Signed by*) H. B. Dixon, Arthur Lapworth, F. P. Burt, W. K. Slater, Colin Campbell, F. Fairbrother, W. J. Jones, A. Parker.

CRABTREE, ARTHUR, Ashfield, Whitkirk, near Leeds. Secretary and lecturer for the Yorkshire Band of Hope Union. Lecturer on the nature and effects of alcohol in high schools and colleges; elected a member of the Society in 1901. Desire to renew my membership that I may receive the Society's publications. Taken courses of honours in chemistry, physiology, practical physiology, hygiene, school hygiene. Two years, part time, research on the influence of alcohol upon digestion, muscle and nerve preparations, etc., at the Durham University College of Medicine, Newcastle-on-Tyne. (*Signed* by) Albert H. Frankland, F. W. Richardson, R. S. Cahill, C. E. Womersley, *Harold M. Read.*

CRONIN, ALEXANDER, 44, Old Canterbury Road, Lewisham, Sydney, N.S.W., Australia. Analytical chemist, Metropolitan Board of Water Supply and Sewerage, Sydney, N.S.W. Author of following papers: (1) "Method of Comparative Analysis of Sewage and Effluents"; (2) "Experiments on the

Purification of Sewage by the Activated Sludge Process." In charge of laboratory for past five years, and hold Diploma in Organic and Inorganic Chemistry, Sydney Technical College. (*Signed by*) Henry G. Smith, A. R. Penfold, Richard W. Challinor, Archibald Ollé, John A. Cresswick.

DANDO, ARTHUR JAMES, 124, Roman Road, London, E.3. Lecturer. B.Sc. (London) First Division; headed list in chemistry. Chief chemist to Aerators', Ltd., London, N., 1913–14; research chemist to J. Rheinberg, F.R.M.S., 1915; science master, St. Dunstan's College, London, S.E., 1917–19; lecturer, the London College of Pharmacy, Clapham, S.W. (present appointment). (*Signed by*) Charles M. Stuart, F. G. Pope, Clarence Smith, Charles A. Keane, J. T. Hewitt.

DATTA, RASIK LAL, D.Sc., 78, Manicktola Street, Calcutta. Assistant professor of chemistry, University College of Science, Calcutta. Author of numerous original contributions to the London Chemical Society and the American Chemical Society on "Halogenation," "Indirect Formation of Double Salts," etc. (*Signed by*) Chuni Lal Bose, B. B. Dey, J. Bhaduri, P. C. Chattopadhyay, *P. S. O'Dowd*.

DAY, FREDERICK WILLIAM FRANCIS, Rubber Growers' Association, Kuala Lumpur, F.M.S. Chemist to above Association. Royal College of Science, 1905–6 and 1906–7; passed chemistry, Parts I., II., and III.; passed Intermediate Science (External), 1906; Battersea Polytechnic, September, 1907, to March, 1909; Central Excise Laboratory for India, April, 1909, to March, 1912; Department of Agriculture, F.M.S., August, 1915, to August, 1918; Rubber Growers' Association, F.M.S., October, 1918, to date; (fuller details refer my original application, March 24th, 1919). (*Signed by*) B. J. Eaton, J. Connah, Geo. Stubbs, J. Carmichael, J. Holmes.

DEAN, WILLIAM PERCY, 1, Beaufort House, Beaufort Street, Chelsea, S.W. Captain. 1904–1914, research on cellulose, etc. (Cross and Bevan); 1918, poison gas research, etc., Anti-Gas Laboratory, R.E. Desire to use library, publications, and to keep in touch with chemical progress. (*Signed by*) Edward Bevan, C. F. Cross, D. R. Davey, A. G. Harrington, W. C. Ball, H. S. Raper, H. Finnemore.

DORAN, WILLIAM, 32, Rufford Road, Fairfield, Liverpool. Assistant lecturer in organic chemistry, Liverpool University. B.Sc. (Liverpool); A.I.C.; for six years assistant chemist in analytical laboratory of Messrs. Evans, Sons, Lescher and Webb, Ltd., pharmaceutical manufacturers; during 1915–1918 chemist to Deputy-Inspector of High Explosives, Liverpool Area. (*Signed by*) Robert Robinson, E. C. C. Baly, W. C. McC. Lewis, F. G. Tryhorn, H. H. Froysell.

DOWNING, LEONARD ALFRED, 17, Carholme Road, Forest Hill, S.E. Student of applied chemistry at City and Guilds' Finsbury Technical College. Being a second-year student of applied chemistry at the City and Guilds' Finsbury Technical College, and wishing to keep in touch with chemical literature and current developments of chemistry. (*Signed by*) G. T. Morgan, H. M. Atkinson, A. J. Hale, Percy Edgerton, J. W. Reginald Youll.

DUDLEY, HAROLD WARD, 10, Lanark Mansions, Maida Vale, W.9. Research chemist. Research with Dr. J. B. Cohen on optical activity of menthyl esters; research with Dr. H. W. Dakin on intermediary metabolism of proteins and carbohydrates; research on specificity of proteins, and on glyoxalase. (*Signed by*) A. G. Harrington, R. H. A. Plimmer, H. S. Raper, Arthur Smithells, J. B. Cohen.

ELLIS, OLIVER COLIGNY DE CHAMPFLEUR, 134A, Denmark Road, Greenheys, Manchester. Research student in Manchester University. B.Sc. (Victoria)

[chemistry and pure and applied mathematics]; served three years in R.N., 1916–1919; have taken appointments as science master at University Demonstration School, Manchester, Sligo Grammar School, Steyning Grammar School, and under the Manchester Education Committee. (*Signed by*) Harold B. Dixon, A. Lapworth, F. P. Burt, J. E. Myers, W. J. Jones, Colin Campbell.

Evans, Gerald Clifton, "Merlin," Banbury Road, Stratford-on-Avon. Technical chemist. Twenty years in employ of Messrs. F. Kendall and Son, Ltd. Student, King's College; afterwards chemist, as above; engaged in analytical, research, and manufacturing; City and Guilds of London technical examinations; first class honours and ordinary, "Brewing"; bronze and silver medal, "Sugar Manufacture"; paper on "Sugar Manufacture" before Institute of Brewing, May, 1919. (*Signed by*) Patrick H. Kirkaldy, W. Waters Butler, Cecil H. Desch, *L. E. Hinkel, P. H. Clifford, Maurice E. Probert.*

Fairgrieve, John Gunter, "Sherwood," Bellshill Road, Uddingston, Lanarkshire. Metallurgical chemist. Two years assistant chemist at The North Eastern Steel Co., Ltd., Middlesbrough; one year assistant chemist at The Darlington Forge Co., Ltd., Darlington; three and a half years chief assistant to W. F. K. Stock, Esq., F.I.C., F.C.S., County Analyst for Durham; seven and a half years chief chemist at Messrs. Pease and Partners, Ltd., Tees Iron Works, Middlesbrough; four years chief metallurgical chemist at the Royal Aircraft Establishment, S. Farnborough. (*Signed by*) John O. Hughes, Gilbert Palmer, Bertram Campbell, A. U. Newton, A. Parker.

Fairweather, Henry Ruchet, "Copthorne," Richmond Road, Sutton Coldfield, Warwickshire. Teacher (M.A.). Since September, 1917, present posts held together: Principal of the Municipal Technical School, Sutton Coldfield, science master of Bishop Vesey's Grammar School, Sutton Coldfield; April, 1915, to September, 1917, second master of the County Secondary School, Devizes (science); May, 1907, to April, 1915, assistant master in the Science Department of Skerry's College Edinburgh. (*Signed by*) James Walker, Alex. C. Cumming, J. C. Irvine, *W. N. Haworth, G. Robertson.*

Fenton, Peter, The Ore Pharmacy, Cardenden, Fife. Dispensing chemist and pharmacist. Member of Pharmaceutical Society, etc.; holder of first class certificates in bacteriology and horticultural science; for six years was engaged in teaching chemistry and botany in the Glasgow College of Pharmacy; diplomate of the College of Optics, Glasgow; prizeman of the West of Scotland Agricultural College; author of papers on "Dispensing Problems," including the chemical points, read at scientific meetings of the Pharmaceutical Society, Edinburgh; private coach in chemistry to mining students locally. Am desirous of keeping in touch with current chemical literature and research. (*Signed by*) Thomas Mackenzie, G. F. Merson, William Mair, *Thos. Stephenson, George Lunan.*

Ferguson, Charles, 32, Margaret Street, Greenock. Manager of sugar refinery. 1881 to 1884, student, Glasgow University, in chemistry, mineralogy, geology, mathematics, zoology, etc. (prizeman in mineralogy); in 1883, passed chemistry exam. (only) of degree of B.Sc. in geological science; 1884 to 1895, head chemist, Glebe Sugar Refinery, Greenock; 1895 to date, manager, Glebe Sugar Refinery, Greenock. (*Signed by*) Robert Mills, John Wm. Biggart, William Love Biggart, Thomas S. Dick, Angus Smith.

Fukuma, Kensaku, Pharmaceutical Institute, Imperial University, Kyoto. Lecturer to the Pharmaceutical Institute. Graduated from College of Science and Technology, Imperial University, Kyoto, in 1909; formerly member to the

Special Research Institute of the University, from 1915 to 1918, working specially on the preparation of organometallic compounds, alkamine, etc.; now lecturer to the Pharmaceutical Institute. (*Signed by*) Masumi Chikashigé, Hikorokuro Yoshida, Toyokichi Takamatsu, Rikō Majima, *Joji Sakurai*, *Michitada Kawakita.*

GARDINER, ALAN ERNEST, 21, Chestnut Road, West Norwood, S.E.27. Chemist at the Imperial Tobacco Co., City Road, London, E.C. Course of technical chemistry at City and Guilds of London College, Finsbury; took active service immediately upon completion of course as corporal in R.E. Special Brigade Gas Service; after two years obtained commission in R.A.F.; on demobilisation obtained present post. Is desirous to have the privileges of the Society. (*Signed by*) James H. Gardiner, Arthur J. Hale, H. M. Atkinson, H. T. Islip, *J. C. Cain, E. C. Powell, Daniel L. Couch, G. Reeves.*

GHOSH, JNANENDRA CHANDRA, 21, Cromwell Road, London, S.W. Lecturer in physical chemistry, University of Calcutta. D.Sc. (Calcutta University); lecturer, University of Calcutta, from 1916; author of several papers on "The Abnormality of Strong Electrolytes" in the *Journal of the Chemical Society.* (*Signed by*) F. G. Donnan, Irvine Masson, W. B. Tuck, W. E. Garner, *J. N. Collie.*

GILBERT, LIONEL FELIX, Frogmore, Beaconsfield, Bucks. Temporary chemical assistant, Government Laboratory, Clement's Inn Passage, W.C. Honours chemistry course, University College, London, 1910–1914; engaged in research (unpublished), 1914; student demonstrator in chemistry, University College, London, 1914; graduated B.Sc., first class honours in chemistry, 1914; employed under Ministry of Munitions, Munitions Inventions Department, April–July, 1919; admitted to Associateship of Institute of Chemistry, April, 1919. (*Signed by*) F. G. Donnan, W. B. Tuck, H. J. Evans, Irvine Masson, Henry Terrey.

GORBOLD, HERBERT WILLIAM, "Camborne," 45, Falmouth Avenue, Highams Park, E.4. Student of applied chemistry, City and Guilds Technical College, Finsbury. As a third-year student of the above College, I am desirous of keeping in touch with current chemical literature and research, and of the use of the Society's library. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, J. R. Fraser.

GOUGH, WILLIAM HENRY, 120, Boleyn Road, Forest Gate. E.7. Research student. B.Sc. (London), 1916; Salters' research fellow, engaged on research in organic chemistry; wishes to keep in touch with the most recent chemical literature. (*Signed by*) H. B. Baker, Jocelyn Thorpe, M. O. Forster, James C. Philip, George Dean, F. H. Streatfeild.

GRAHAM, HUGH, 125, Wellesley Avenue, Belfast. Student. B.Sc., Queen's University, Belfast; manufacturing chemistry, two years' experience of manufacture of fuming sulphuric acid (contact process); one year technical research. (*Signed by*) A. W. Stewart, A. Killen Macbeth, R. Wright, *Henry Wren*, *Wm. W. Myddleton.*

GRANT, ROBERT, 24, Edward Street, Woollalua. Bacteriologist, Microbiological Laboratory, Department of Public Health. Read before the Sydney Technical College Chemical Society:—(1) "Snakes and their Venoms"; (2) "Bacteriology of the Activated Sludge Process of Sewage Purification"; (3) "Bacteriological Technique in connection with the Examination of Sewage"; (4) "New Form of Gas Sampler"; (5) "Serum-collecting Apparatus"; (6) "Modified Form of Splash-head." Read before a joint meeting of the British Medical Association (New South Wales Branch) and the Electrical Association:— "Some Practical Points in Ionic Medication," by W. H.

Myers and R. Grant. Read before the Linnean Society of New South Wales :—"Note on a Lymph-filling Apparatus," by R. Grant and A. B. Duffy. Late lecturer on dairy bacteriology, Dairy Science Schools, Department of Agriculture, New South Wales. (*Signed by*) A. R. Penfold, R. W. Challinor, Henry G. Smith, Archibald Ollé, W. M. Doherty.

GROVES, JOHN, "Llanvaches," Somerton Road, Newport, Mon. Analytical chemist. Chief assistant chemist, Messrs. John Lysaght, Ltd., Orb Iron Works, Newport, Mon.; assistant lecturer in metallurgy, Newport (Mon.) Technical Institute. (*Signed by*) J. A. Hatfield, H. E. Cox, T. C. Sharrott, E. Escott Wood, William Bush, *Harry Silvester*.

HACKSPILL, LOUIS JEAN HENRI, 14, rue Silbermann, Strasbourg, France. Professeur à la Faculté des Sciences de l'Université de Strasbourg. Ingénieur chimiste, I.C.A., Paris; Dr. ès Sciences physiques. (*Signed by*) George P. Pollitt, H. C. Greenwood, Harold Hartley, Alfred Egerton, Georges Baume.

HARRISON, WILFRED, 151, Wigan Road, Ashton-in-Makerfield, near Wigan. Mine chemist. Chief chemist to a large firm of colliery proprietors, and at the present time on a little research work for the above people in the College of Technology, Manchester; have finished my fourth stage chemistry and was successful; also holder of first class honours gas engineering, City and Guilds certificate; also in final fuels examination produced by the Wigan Mining College; and holder of several Lancashire and Cheshire certificates in mining and engineering; have been with the said firm for the last ten years, as apprentice, assistant, and now in charge. (*Signed by*) Frank Bayley, Burrows Moore, C. Polychronis, S. J. Peachey, *F. M. Rowe*.

HELSBY, FRANK WILLIAM, Norfolk House, 38, Guildford Street, Russell Square, W.C.1. Student of King's College, University of London. Student studying for B.Sc. (honours chemistry), and desire to use library and attend readings of scientific papers; science lecturer under R.A.F. educational scheme; certificate. (*Signed by*) Arthur W. Crossley, *A. J. Allmand*, Leonard E. Hinkel, W. D. Halliburton, O. Rosenheim.

HEPSWORTH, DOUGLAS RAOUL HALL, 431, Holloway Road, London, N. Chemist in the employ of Messrs. Renny, Forbes and Co., Ltd., Alperton, Wembley, artificial manure manufacturers, with whom I have been for the last four years. Engaged on the analysis of soils and fertilisers and experimental work in connection with same; chemistry student two and a half years, Battersea Polytechnic. I desire to join the Society in order that I may keep in touch with modern agricultural and analytical chemistry. (*Signed by*) John Wilson, J. L. White, J H. Johnston, *A. Housa, F. G. Mann*.

HING, SAMPSON MANSON, Y.M.C.A., Tottenham Court Road, W.1. Analytical chemistry. Assistant to Prof. J. B. Harrison, Government Laboratory, British Guiana, and subsequently to Dr. E. R. Moritz and Mr. F. J. Lloyd, of London, and also to the London County Council. (*Signed by*) E. R. Moritz, Horace T. Brown, Charles R. Beck, J. H. Coste, F. J. Lloyd.

HOLMES, EDGAR WILLIAM, 4, Massey Street, St. George's Road, Hull. Works chemist and departmental manager, Messrs. Major and Co., Ltd., coal tar distillers, Sculcoates, Hull. Diploma, City of Bradford Technical College in chemistry and dyeing; four years' day course at that institution; first-class certificates of the Board of Education in organic and inorganic chemistry (theoretical and practical); first-class certificates of the City and Guilds of London Institute in cotton, wool and silk dyeing, and coal tar distillation; hold the degree of A.I.C.; 4½ years chemist assistant manager with Messrs. Newton, Chambers and Co., Sheffield; 2 years chemist works manager, Silsden

Dyeing Co., Ltd., Keighley; 5 years as chemist and chief departmental manager, Messrs. Major and Co., Ltd., Hull—still retain this position. (*Signed by*) Walter M. Gardner, Arthur R. Warnes, John Denton, *Arnold R. Tankard, Thos. A. Nightscales.*

Horiba, Shinkicki, c/o The Sumitomo Bank, Ltd., 87, Gracechurch Street, E.C., London. Assistant Professor of Kyoto Imperial University of Japan. Graduated at the College of Science, Kyoto Imperial University in 1910. Assistant Professor of the above university, 1913. (*Signed by*) J. C. Cain, Alex. Findlay, J. W. Mellor, Samuel Smiles, *A. J. Greenaway.*

Hughes, Edwyfed Wynne, Llys Elen, Pen-y-groes, North Wales. Senior chemistry master, Erith County Secondary School, Kent. M.Sc. by research; B.Sc., second-class honours, chemistry; second-class honours, geology; research student of chemistry at Cardiff University College. (*Signed by*) Claude M. Thompson, E. P. Perman, Ernest Vanstone, Colin H. Lumsden, *Maurice Copisarow.*

Ingold, Christopher Kelk, c/o Phail, 3, Kelbourne Street, N. Kelvinside, Glasgow. Chemist, Cassel Cyanide Company, Glasgow. Contributions to *Journal*: Trans., 1915, **107**, 1080; Trans., 1919, **115**, 143; Trans., 1919, **115**, 320; degrees and diplomas: B.Sc. (Hons. Chem.), A.R.C.S., D.I.C.; chemistry student, 1911-1914; process chemist, C. C. Co., Glasgow, 1914-1918; research chemist, C. C. Co., Glasgow, 1918 to date. (*Signed by*) Jocelyn Thorpe, H. F. Harwood, A. D. Mitchell, G. A. R. Kon, *Arthur A. Eldridge.*

Jones, David Charles, 4, Primrose Terrace, St. Michael's Street, Shrewsbury. Chemist (research). B.Sc. (first class, Hons. Chem.), Wales, 1917; M.Sc. by research (Wales), 1919. (*Signed by*) Kennedy J. P. Orton, Alex. Findlay, John O. Hughes, *T. Campbell James, C. R. Bury, Claude M. Thompson.*

Jung, Julius, 14, Bancroft Road, E.1. Student of chemistry, Technical College, Finsbury, E.C.2. Wishes to keep in touch with the most recent developments of chemical science. (*Signed by*) Arthur J. Hale, G. T. Morgan, H. M. Atkinson, N. Singer, H. Singer, *F. D. M. Hocking.*

Khan, Abdus Samad, Patna College, Bankipore, India. Chemist. B.Sc. (Calcutta), M.Sc. (Manchester); research work under Prof. A. Lapworth, D.Sc., F.R.S. (not published); assistant lecturer, Patna College, India (1912-15); part-time demonstrator in organic chemistry, College of Technology, Manchester (1918-19). (*Signed by*) H. B. Dixon, A. Lapworth, F. P. Burt, J. E. Myers, W. J. Jones, Colin Campbell.

Knaggs, John, South Street, Bridlington, Yorks. Lieutenant, R.E., Mesopotamia Expeditionary Force. A.R.C.Sc. (first class in chemistry); B.Sc. (London). (*Signed by*) H. B. Baker, James C. Philip, Jocelyn Thorpe, P. W. Robertson, A. T. King.

Lawrie, Leslie Gordon, Field View, Stoke Prior, Bromsgrove. Technical chemist. Student, Manchester University (Technical College); passed sessional examinations in organic, inorganic, and practical chemistry and physics (sessions, 1908–1910); first class certificate for microscopical research; analytical and research chemist for 4½ years to Messrs. James Templeton and Co., Glasgow, up to 1914; 6 months in laboratory of Badische Co., Mannheim, Germany; research on action of ultra-violet light on dyestuffs and other subjects. (*Signed by*) J. A. Hewitt, Arthur Smithells, Arthur W. Crossley, *J. C. Irvine, W. N. Haworth.*

Lawson, Norman Stuart, 69, St. George's Road, S.W.1. Second-year

student, Royal College of Science. Student. (*Signed by*) James C. Philip, A. T. King, A. A. Eldridge, H. F. Harwood, P. W. Robertson.

LEAPER, CLEMENT JOSEPH, Nuns' Island, Galway. Chemist to the Galway Vitriol and Fertiliser Works (Messrs. McDonogh and Sons). Ex-student, Royal College of Science, Dublin; associate of the Institute of Chemistry; formerly a Fellow of the Chemical Society; left the Society owing to his being chiefly interested in electrical engineering at the time, but has been employed as above for the past three years, and intends to take up chemistry again. (*Signed by*) Emil. A. Werner, Julius Ostersetzer, W. E. Adeney, *Sydney Young*, *William Caldwell*.

LLOYD, WILLIAM VERNON, Keeston, Holland Road, Weymouth. Chemistry master, Latymer Grammar School, Edmonton, N.9. B.Sc. (Lond.), 1914. (*Signed by*) Charles A. Keane, Henry J. S. Sand, P. C. L. Thorne, E. de Barry Barnett, Herbert L. Howard.

LOWNDES, ASHLEY GORDON, Eglinton Place, Saltcoats, Ayrshire, N.B. Research chemist and microscopist to Research Department, Nobel's Explosives Co., Stevenston, Ayrshire, N.B. M.A., Camb. Nat. Sci. Tripos. 3 years head science master at King's School, Canterbury; co-patentee with Nobel's lead azide—unpublished at present. (*Signed by*) Charles T. Heycock, R. A. Joyner, N. Picton, Wm. Barbour, Thos. J. Nolan.

LUSH, ERNEST JOSEPH, 29, St. Peter's Square, Hammersmith, W.6. Technical chemist. B.A. (Cantab.), first class honours; research chemist, 3 years, Messrs. Lever Bros., Port Sunlight; technical chemist, 1 year, Messrs. Brotherton Co., Leeds; research chemist at present with E. R. Bolton, Esq., F.I.C., 46, Stamford Brook Road, W.6. (*Signed by*) E. Richards Bolton, L. H. Dyke Acland, W. J. Pope, W. H. Simmons, *P. A. Ellis Richards*.

MCCALL, ROBERT, 23, Bellevue Crescent, Ayr, Scotland. Research chemist. Graduate in arts and science (Edinburgh); 1 year, post graduate research as Carnegie research scholar. Published, in conjunction with W. Cramer, three papers on carbohydrate metabolism in *Journal Experimental Physiology;* associate of the Institute of Chemistry; 2½ years as research chemist, Royal Arsenal, Woolwich. (*Signed by*) A. Forster, W. H. Gibson, J. S. Dick, Robert Robertson, W. L. Baillie, *A. Vincent Elsden*.

MILLER, ERIC JULIUS, 7, Buckingham Gardens, Perambur Barracks, Madras. Assistant chemist, Buckingham Mill, Madras. Student at the Leeds University, 1910-12; assistant chemist at the Buckingham Mill, Madras, for six years; associate of the Institute of Chemistry. (*Signed by*) Samuel Jackson, Arthur G. Green, A. G. Perkin, Arthur Smithells, J. B. Cohen.

MORAY, ARISTIDE, Longthorpe Lodge, 351, Goldhawk Road, Ravenscourt Park, W.6. In business on my own account. Manufacturing chemist. Specialised in chemistry of casein and casein glues; discovered several new casein glues at present used in industry. (*Signed by*) J. C. N. Eastick, James P. Ogilvie, R. H. Harry Stanger, *H. Singer*, *C. Diamond*.

MORTIMER, ARTHUR, 9, Leeds Road, Harrogate. Pharmacist. Lecturer on chemistry and pharmacy, Livingstone College, Leyton, E.; teacher of dispensing, etc., to missionaries, St. James the Less Medical Mission, Bethnal Green, E.; now secretary and manager of Harrogate Chemists Limited, chemical manufacturers and wholesale chemists. (*Signed by*) F. Pilkington Sargeant, F. W. Richardson, Walter M. Gardner, *Albert H. Frankland*, *Geo. R. Tweedie*.

MORTON, CHARLES, 38, Larkhall Rise, Clapham, S.W. Lecturer in pharmacy and pharmaceutical chemistry. Major diploma of the Pharmaceutical

Society. At present chief lecturer in pharmaceutics at the South-Western Polytechnic Institute, Chelsea, and lecturer in inorganic chemistry at the London College of Pharmacy, 361, Clapham Road. (*Signed by*) H. Lucas, R. S. Glennie, C. T. Bennett, *J. L. White, David J. Williams.*

MUKHERJEE, JNANENDRA NATH, Calcutta, Bengal, India; at present, 21, Cromwell Road, South Kensington, London, S.W.7. Lecturer in chemistry, University of Calcutta (on study leave). Lecturer in chemistry, University of Calcutta, since 1916; M.Sc. (Chemistry), University of Calcutta. Following publications: (1) *J. Amer. Chem. Soc.*, 1915, 37, 292–297, 2029–2031; (2) *T.*, 1919, 115, p. 461. (*Signed by*) F. G. Donnan, Irvine Masson, W. B. Tuck, W. E. Garner, *J. N. Collie.*

NASH, ALBERT, Holly House, Wath-on-Dearne. Chief chemist of collieries, coke ovens, and bye-product works. Associate of the Institute of Chemistry. (*Signed by*) L. T. O'Shea, John W. Lee, Ernest M. Myers, Philip B. Nicholson, *G. A. Hebden.*

NEAL, SAMUEL ESSEX, 48, Auckland Avenue, Hull. Works chemist. I had three years' training in the laboratories of the Hull Municipal Technical College; prior to the war, I was in charge of one of the laboratories of the British Oil and Cake Mills, Ltd., for seven years; my work during the war was in connection with the production of glycerine by the Twitchell process, including the manufacture of the reagent itself. (*Signed by*) Geo. H. Appleyard, Harry Thompson, W. Geary, Arnold R. Tankard, Arthur R. Warnes.

NEAVERSON, LEWIS, Clough Edge, Halifax Old Road, Huddersfield. Textile research chemist. Student for five years in the Dyeing and Chemistry Department at Huddersfield Technical College; three years a partner in a firm of piece dyers; two years assistant lecturer in dyeing at Huddersfield Technical College; twelve and a half months head textile chemist at J. Foster and Son, Ltd., Amesbury. (*Signed by*) G. H. Frank, H. Royal-Dawson, L. O'Brien, *A. Clayton, Charles K. Crosland.*

NEWCOMB, CLIVE, 48, Leigham Court Road, Streatham, S.W.16 Captain, I.M.S. B.A., M.B., B.Ch.Oxon., M.R.C.S., L.R.C.P.; 2nd class honours in chemistry finals at Oxford, 1905; before the war, chemical examiner (on probation) to the Government of Bengal, to which post he hopes to return. (*Signed by*) D. L. Chapman, M. P. Applebey, D. H. Nagel, W. W. Fisher, J. E. Marsh.

O'BRIEN, ARTHUR MATTHEW, Abadan, Persian Gulf, Chief chemist, Anglo-Persian Oil Co., Ltd., Persia. Six years in laboratory of Messrs. J. Crosfield and Sons, Ltd., Warrington; three years in laboratory of Scottish Co-operative Wholesale Society, Ltd., Grangemouth; six years with Messrs. Burmah Oil Co., Ltd., Rangoon; five years with Messrs. Anglo-Persian Oil Co., Ltd., as chief chemist. (*Signed by*) H. M. Langton, A. E. Dunstan, F. B. Thole, Andrew Campbell, E. Lawson Lomax.

PAGET, HUMPHREY, 7, Palace Mansions, Lambeth Road, S.E.1. Research chemist at Wellcome Chemical Research Laboratory, 6, King Street, Snow Hill, E.C. 3rd Class Hon. Sch. Nat. Sci. (Chemistry), Oxford. (*Signed by*) H. B. Baker, T. A. Henry, R. R. Baxter, R. G. Fargher, J. A. Goodson.

PANDYA, KANTILAL C., Agra (India). Professor of chemistry, St. John's College, Agra. Professor of chemistry since July, 1913, and head of the Chemistry Department since July, 1916, St. John's College, Agra. (*Signed by*) J. J. Sudborough, D. D. Kanga, A. R. Normand, M. J. Gajjar, G. B. Kolhatker.

PORTEOUS, JAMES WILLIAM, Grange Hill, Bishop Auckland, Co. Durham. General manager and chief chemist. General manager and chief analytical chemist for Messrs. Bolckow, Vaughan and Co.'s coke works, bye-product and chemical plants; also consulting chemist for Newfield Silica and Firebrick Works; from 1892 to 1901, assistant teacher of chemistry, steam, steam engines, machine construction, and mechanical drawing at Pearce West Technical Classes. (*Signed by*) Martin Ernest Fyleman, Ernest Bury, P. Phillips Bedson, *John W. Lee, D. V. Hollingworth.*

PRATT, JAMES DAVIDSON, 3, Leinster Gardens, London, W.2. Captain, Gordon Highlanders, T.F. (at present Staff Captain to D.5, Chemical Warfare Section, Directorate of Artillery, War Office). Student, Aberdeen University, 1908–1913; graduated M.A. (with Honours) in March, 1912, and B.Sc. (with Hons. in Chemistry), March, 1913; chemical research as Carnegie Research Scholar, April, 1913, to January, 1914; junior assistant in chemistry to Prof. Japp, January to August, 1914; August, 1914, to August, 1916, on active service; August, 1916, to December, 1918, assistant secretary of the Chemical Advisory Committee of the Ministry of Munitions, and its successor, the Chemical Warfare Committee; became secretary of Chemical Warfare Committee on January 1st, 1919. (*Signed by*) H. Hartley, Jocelyn Thorpe, Arthur W. Crossley, A. J. Allmand, George Beilby.

RANDALL, ERNEST LESLIE, A.I.C., 6, Belgrave Terrace, New North Road, Huddersfield. Works chemist. In *Chemical News*, June 9th, 1916, author of "The Estimation of Ferro- and Ferri-cyanides in the Presence of Cyanides and Thiocyanates"; three years' course Institute of Chemistry at King's College, London; admitted an Associate in January, 1919; six years with the Tottenham Gas Co. as assistant chemist; three years with the Croydon Gas Co. as chief chemist; three years with British Dyes, Ltd., as works chemist (my present position). (*Signed by*) J. C. Cain, M. O. Forster, E. F. Pollock, D. H. Peacock, R. G. Parker.

ROSE, CHARLES, 603, Chorley New Road, Horwich, Lancs. Schoolmaster. B.Sc. (London), 1907; Chief Science Master at Rivington and Blackrod Grammar School, Horwich, since 1908; Senior Science Master at the Crypt Grammar School, Gloucester, from 1903 to 1908. (*Signed by*) J. R. Partington, F. G. Pope, R. W. L. Clarke, *L. H. Parker, W. A. T. Nash.*

SAYNER, GEORGE SMITH, "Parkhurst," Queen's Road, Richmond, Surrey. Gas engineer (chemical). Honours certificates in practical analytical chemistry, 1888; bronze medallist, etc., in City and Guilds examination results; engineer and works manager at Harrogate, 1892 to 1914; member Institution of Gas Engineers from 1893; author of papers on tar for road-making and motor fuels, gaseous and liquid; member of committees in Department of Scientific and Industrial Research; gas and chemical expert in charge of Ministry of Munitions and Air Ministry gas and gear requirements from July, 1916, to date. (*Signed by*) Chas. Wood, J. Wilkinson, Thomas Turner, *Samuel Field, H. C. H. Carpenter.*

SCOTT, JAMES LANG, Twynholm, Bramley, Surrey. Chief chemist and factory assistant manager (Chilworth Gunpowder Co., Ltd., Chilworth Mills, Surrey). Associate of Institute of Chemistry; sixteen years' experience as technical chemist after training in day classes (1899–1903) of Technical College, Glasgow. (*Signed by*) Wm. Rintoul, J. Rogers, G. G. Henderson, *William Dickson, Wm. Barbour.*

SENSICLE, LAURENCE HENRY, 73, Dumfries Street, Treorchy, Rhondda, Glam. Analytical chemist. B.Sc. (War), London University; 1913–1916,

demonstrator and assistant chemist at the South Wales and Monmouthshire School of Mines, Treforest and Crumlin; 1916 to January, 1919, 1st Class Mechanic (Chemist Rating) in the Royal Navy (Experimental Section); at present chief chemist to the Ocean Colliery Co., Treorchy, Rhondda. (*Signed by*) A. Sydney Vince, S. Roy Illingworth, T. Slater Price, J. E. Coates, H. D. K. Drew.

SHIELS, DOUGLAS OSWALD, Hawthorn, Melbourne, Victoria, Australia. Teacher. B.Sc. (Melbourne), chemistry being chief subject, first, second, and third years being taken; science and mathematical master at Ballarat College, Victoria, for one and a half years, teaching chemistry, physics, to matriculation standard; from February, 1919, to present date, have been engaged on post-graduate study of chemistry at King's College, University of London; from September, 1915, to February, 1919, on active service with Australian Imperial Force. (*Signed by*) Patrick H. Kirkaldy, Maurice E. Probert, Leonard E. Hinkel, Percy H. Clifford, W. D. Halliburton.

SHORT, WALLACE FRANK, 11, Brighton Grove, Rusholme, Manchester. Research in chemistry. B.Sc., First Class Honours in Chemistry, 1918; Levinstein Scholar; elected Beyer Fellow of Manchester University, June, 1919; June, 1918, to January, 1919, research chemist, employed by Woolwich Arsenal in the Manchester Laboratories under Prof. H. B. Dixon.; M.Sc. thesis, "A New Method for the Preparation of Monochlormethyl Derivatives in the Aromatic Series." (*Signed by*) Harold B. Dixon, Arthur Lapworth, Henry Stephen, William K. Slater, F. P. Burt, J. E. Myers, W. J. Jones.

SKLAR, ISAAC, 29 Clark Street, Stepney, E.1. Student. Student at East London College for past three years. Shall sit for the final B.Sc. Honours, 1919, in chemistry. I desire to keep in touch with modern chemical work. (*Signed by*) J. R. Partington, F. G. Pope, Hugh C. H. Candy, J. Tavroges, *L. H. Parker.*

SPEARING, COLIN EVERETT, "Winalade," Eversfield Road, Reigate. Student of applied chemistry, City and Guilds Technical College, Finsbury. As a third year student of the above college, I am desirous of keeping in touch with current chemical literature and research, and of the use of the Chemical Society's library. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, J. W. Reginald Youll.

STAHLE, LEON ROSSITER DALGLISH, "Gwandalan," Muir Street, Hawthorn, Victoria, Australia. Wholesale and manufacturing chemist, Australia. (Lieutenant, 34th Battalion, A.I.F.). Member, Pharmaceutical Society of Australasia; pharmaceutical and analytical chemist (registered, Victoria); gold medallist, Department of Agriculture, Victoria, in special work in connection with chemistry of agriculture and veterinary science; studies at South-Western Polytechnic Institute, March to July, 1919. (*Signed by*) J. B. Coleman, F. H. Lowe, H. Jephcott, *J. H. Robbins, C. Proctor.*

TAYLOR, JAMES, 2, Nibthwaite Road, Harrow, Middlesex. Student. I desire admission to the Chemical Society to obtain the use of the library, and to keep in touch with modern developments. I am a third year student at East London College, reading for B.Sc. Hons. Chemistry. (*Signed by*) F. G. Pope, S. P. Kipping, O. A. Le Beau, J. R. Partington, *Hugh C. H. Candy.*

THORN, CYRIL KENWYN WALTER, 72 Paris Street, Exeter. Completed second and third years' Final Honours course in chemistry (1913-1915) at King's

College, London; granted B.Sc. (War) Lond. in July, 1916; employed July, 1915, to December, 1918, by Ministry of Munitions at King's College under Professor P. H. Kirkaldy in analysis of coal-gas by-products—coal-tar, benzol, etc. (*Signed by*) Patrick H. Kirkaldy, L. E. Hinkel, P. H. Clifford, Maurice E. Probert, Arthur W. Crossley.

WALLEN, ERNEST EDWARD, 8, Glade Street, Bolton, Lancs. Head chemist and manager of the National Chemical Co., Falds Road and Goodwin Street, Bolton. Research on aniline dyes; produced a very fine permanent red (pigment); sole charge of the manufacturing in the above works of various chemicals, dyes, and pigment colours; since leaving the Technical College (1½ years ago) have always been connected with chemical and colour trades. (*Signed by*) W. H. Barker, E. D. Griffiths, E. Hardiker, *Robt. P. Douglas, J. Stewart Remington.*

WALLS, ERNEST, The Garthe, Percival Road, Clifton, Bristol. Soap manufacturer. First class Final Honours, School of Natural Science (Chemistry), Oxford, 1902; continuously engaged since 1903 in manufacture of soap, glycerine and candles; have invented various processes and improvements connected therewith. (*Signed by*) F. Francis, J. W. McBain, F. W. Rixon, *Samuel Smiles, James C. Philip.*

WALLS, NOEL STANLEY, B.Sc., 45, Platt Lane, Hindley, Lancs. Research chemist, Manchester University. Acted as assistant in high explosives laboratory for two years; now assisting in the alcohol motor-fuel research under Prof. H. B. Dixon. (*Signed by*) H. B. Dixon, Arthur Lapworth, J. E. Myers, W. J. Jones, Colin Campbell.

WATSON, WILLIAM NELSON, c/o Mrs. McQueen, 1, Bank Street, Irvine, Ayrshire. Metallurgical chemist. Chief chemist, Messrs Brand's Pure Spelter Co., Guiles Road, Irvine; member of the Institute of Metals; member of the Glasgow and West of Scotland Iron and Steel Institute. (*Signed by*) Douglas A. MacCallum, R. Tennant, A. Campion, G. G. Henderson, *R. T. Thomson, James M. Cracken.*

WESTON, ARTHUR CHARLES VINCENT, 24, Belsize Park Gardens, Hampstead, N.W.3. Assistant technical chemist to Menley and James, Ltd., manufacturers of fine chemicals. Fifteen years' experience in chemical manufacture; studied chemistry under A Jamieson Walker, Esq., Ph.D., B.A., F.I.C.; holder of scholarship tenable for three years at the Derby Technical College; studied advanced organic chemistry (practical and theoretical) at the Leicester Technical School; holder of four certificates (including advanced) of the Board of Education in chemistry, both practical and theoretical; studied chemistry under Professor Arthur Crossley, D.Sc.; studied pharmaceutical science under Professor Greenish, F.I.C., one of the two editors of the *British Pharmacopœia;* graduate of the Pharmaceutical Society, and a member of that body. I wish to come into closer touch with current chemical progress, to receive the *Journal* of the Chemical Society and attend its meetings. (*Signed by*) A. Jamieson Walker, Arthur W. Crossley, F. W. Crossley-Holland, C. H. Hampshire, Saml. W. Woolley.

WILLIAMS, HAROLD BISHOP, "Ashley," 6, Hamlet Road, Upper Norwood, S.E. Student of applied chemistry, City and Guilds Technical College, Finsbury. As a third-year student of the above college, I am desirous of keeping in touch with current chemical literature and research, and to have the use of the Society's library. (*Signed by*) G. T. Morgan, A. J. Hale, H. M. Atkinson, Percy Edgerton, H. Singer.

YAJNIK, NARSHESHANKER AMARJI, M.A. (Bom.), A.I.C. (Eng.), Purani

Anarkali, Lahore, India. Professor of Chemistry, Forman Christian College, Lahore, India. B.A. (Hon.), second class in physics and chemistry (Bombay University), stood first among all the university candidates in that group in 1914; Dakshina Fellow, Wilson College, Bombay, 1915-1916, July; M.A. in chemistry, with second class, 1916; assistant professor of chemistry, St John's College, Agra, July, 1916, to Oct., 1918; professor of chemistry, F.C. College, Lahore, from Oct., 1918; in charge of the M.Sc. classes; special work in rare minerals for A.I.C. examination. (*Signed by*) Bawa Kartar Singh, A. R. Normand, S. R. Khosla, Ruchi Ram Sahni, Hashmat Rai.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-Law I (3):

COGHILL, DOUGLAS, Kuala Lumpur, Federated Malay States. Agricultural chemist. For three and a half years assistant in the Chemical Laboratory of the Department of Agriculture, Cape Town, South Africa; for two and a half years assistant on a rubber plantation in Kedah; present position, assistant agricultural chemist, Department of Agriculture, Kuala Lumpur, Federated Malay States; have received training in advanced organic and biochemistry. (*Signed by*) B. J. Eaton.

DOVEY, ERNEST ROADLEY, Government Laboratory, Hongkong. Government analyst, Hongkong. Chemist in Bureau of Science, Manila, for two years; now Government analyst of Hongkong, lecturer in chemistry and metallurgy, Hongkong Technical Institute, and sometime examiner in chemistry to Hongkong University. (*Signed by*) John C. H. Mingaye, W. M. Doherty, Henry G. Smith.

GHOSH, TARAPADA, B.Sc., P.O. Tala, District Khulna (Bengal). Chemist, The Indian Oil Products Co., Calcutta. Author of the following original papers: (1) "The Preparation of Benzoylchloramide" (*J. Amer. Chem. Soc.*, 35 (1913), 1044-1045): (2) "Indirect Formation of Double Salts" (*J. Amer. Chem. Soc.*, 36 (1914), 1017-1022). (*Signed by*) P. S. O'Dowd, J. Bhaduri, *P. C. Chattopadhyay, C. L. Bose, B. B. Dey.*

LAW, CAPTAIN BRUNEL ROBERT, A.I.F., "Birralee," Sussex Street, Brighton, Victoria, Australia. Assistant analytical chemist, Mount Lyell Mining and R. Co., Ltd. Studied chemistry, W.M. College, Melbourne; passed first and second year practical and theoretical chemistry; two years' works and laboratory experience with Mount Lyell prior to outbreak of war; still on service, but studying methods of H.M. Factories (chemical) in Britain. (*Signed by*) Robert Law, *F. V. Ramsden, Henry W. Levy.*

LORD, EDWARD SANDFORD, B.A. (King's, N.S.), Gladstone, Manitoba, Canada. High school principal. Lecturer in chemistry and principal of Britannia High School, 1910–1916; lecturer in chemistry and principal of Melita High School, 1916-1918; lecturer in chemistry and principal of Gladstone High School (from February, 1918). (*Signed by*) James A. Audley, Herbert J. Gover.

PRINS, EUGÈNE CHARLES, Kilkade, Zeehaven, Dordrecht (Holland). Managing director of the N.V. Stikstofbindingsindustrie, Nederland, at Dordrecht (Holland). Formerly chemical engineer at the Oil Works, Calvé-

Delft, at Delft; now managing director of a nitrogen-fixation plant (Stikstofbindingsindustrie, Nederland, at Dordrecht). (*Signed by*) H. J. Backer, *George Barger*.

SIMITHRAARATCHY, CHARLES EDWARD, Trinity College, Kandy, Ceylon. Teacher at Trinity College. B.Sc. (London); assistant to the late Mr. N. P. Campbell, M.A., F.C.S., A.I.C.; science master at Trinity College, Kandy. (*Signed by*) W. N. Rae, J. P. C. Chandrasena, A. Bruce, *M. Kelway Bamber*.

YOUNG, MAXWELL WILLIAMSON, 11, Burnell Avenue, Wellington, N.Z. Analytical chemist. Late assistant to Dr. Tocher, Aberdeen; now assisting Prof. Easterfield in a technological investigation on phormium tenax, and another on the brown coals of New Zealand. (*Signed by*) Thomas H. Easterfield, B. C. Aston, Geo. Bagley.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, December 4th, 1919, at 8 p.m., Sir JAMES J. DOBBIE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT announced that he had been authorised by the Council to sign a Petition to the President of the Board of Trade praying that the Library of the Patent Office should be open daily until 10 o'clock p.m., as was the practice for twenty-five years before the War. Fellows of the Society were invited to sign the Petition.

Mr. W. H. Crouch was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

Samuel Alker, B.Sc., El Trigorifico, Campana F.C.C.A., Argentina.
Percy Alfred Beckley, B.A., Waverley, Belvedere, Kent.
Thomas Robert Bell, B.Sc., 2, Marine Crescent, Hartlepool.
Douglas Arthur Clibbens, B.Sc., Ph.D., 44, Lee Park, Blackheath, S.E.3.
Dalziel Llewellyn Hammick, B.A., 21, Edgar Road, Winchester.
Thomas Cranston Jacobs, c/o British Sugar Co., San Jacinto, Samanco, Peru.
Anian Walter Richard Joachim, 40a, Aberdeen Park, Highbury, N.5.
Ernest Wilson McClelland, B.Sc., 10, Portland Terrace, Jesmond, Newcastle-on-Tyne.
Sydney Andrew Mann, B.Sc., Pathological Laboratory, Mandsley Hospital, Denmark Hill, S.E.5.
Neville Bensley Mattingley, 68, Dornton Road, Balham, S.W.12.
Lionel Hewgill Smith, 58, High Street, Bridlington.
Alfred Thomas, 57, Old Town, Clapham, S.W.4.
Lionel James Truss, 3, Langdale Road, Victoria Park, Manchester.
Armand de Waele, c/o D. Gestetner, Tottenham Hale, N.17.

Messrs. L. E. Hinkel and H. G. F. Micklewright were appointed Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared by the PRESIDENT as having been elected Fellows:

George James William Anderson, Dr. Ing.
Francis Arnall, B.Sc.
Donald Hugh Bangham, B.A.
Charles Oliver Barber, B.Sc.
Arthur Neal Barker.
William Barnes.
Frank Leslie Barrett.
Walter Cyril Batty, B.Sc.
Harold William Bausor, M.A.
John Broadhouse Herbert Beards.
Arthur George Vale Berry.
Eric Clifford Berry.
Philip Blenkinsop.
John Scott Walker Boyle, M.A., B.Sc.
Thomas Kerfoot Brownson, B.A., M.Sc.
Philip Cecil Bull.
Frederick William Bunyan.
Stanley Lees Burrows.
Lawrence Eversley Campbell, B.Sc.
Sydney Raymond Carter, M.Sc.
Herbert Grey Catterall.
Douglas Coghill.
Harry Cooper.
Angus Fairthorne Core, M.Sc.
Colin Granville Core, M.Sc.
Arthur Crabtree.
Alexander Cronin.
Arthur James Dando, B.Sc.
Rasik Lal Datta, D.Sc.
Frederick William Francis Day.
William Percy Dean.
William Doran, B.Sc.
Ernest Roadley Dovey.
Leonard Alfred Downing.
Harold Ward Dudley.
Oliver Coligny de Champfleur Ellis, B.Sc.
Gerald Clifton Evans.
John Gunter Fairgrieve.
Henry Ruchet Fairweather, M.A.
Peter Fenton.
Charles Ferguson.
Kensaku Fukuma.
Alan Ernest Gardiner.
Jnanendra Chandra Ghosh, D.Sc.
Tarapada Ghosh, B.Sc.
Lionel Felix Gilbert, B.Sc.
Herbert William Gorbold.
William Henry Gough, B.Sc.
Hugh Graham, B.Sc.
Robert Grant.
John Groves.
Louis Jean Henri Hackspill, Dr. ès Sc.
Wilfred Harrison.
Frank William Helsby.
Douglas Raoul Hall Hepsworth.
Sampson Manson Hing.
Edgar William Holmes.
Shinkicki Horiba.
Edwyfed Wynne Hughes, M.Sc.
Christopher Kelk Ingold, B.Sc.
David Charles Jones, M.Sc.
Julius Jung.
Abdus Samad Khan, M.Sc.
John Knaggs, B.Sc.
Brunel Robert Law.
Leslie Gordon Lawrie.
Norman Stuart Lawson.
Clement Joseph Leaper.
William Vernon Lloyd, B.Sc.
Edward Sandford Lord, B.A.
Ashley Gordon Lowndes, M.A.
Ernest Joseph Lush, B.A.
Robert McCall.
Eric Julius Miller.
Aristide Moray.
Arthur Mortimer.
Charles Morton.
Jnanendra Nath Mukherjee, M.Sc.
Albert Nash.
Samuel Essex Neal.
Lewis Neaverson.
Clive Newcomb, B.A., M.B.
Arthur Matthew O'Brien.
Humphrey Paget, B.A.
Kantilal C. Pandya.
James William Porteous.
James Davidson Pratt, M.A., B.Sc.
Eugène Charles Prins.
Ernest Leslie Randall.
Charles Rose, B.Sc.
George Smith Sayner.

James Lang Scott.
Laurence Henry Sensicle, B.Sc.
Douglas Oswald Shiels, B.Sc.
Wallace Frank Short, B.Sc.
Charles Edward Simithraaratchy, B.Sc.
Isaac Sklar.
Colin Everett Spearing.
Leon Rossiter Dalglish Stahle.
James Taylor.
Cyril Kenwyn Walter Thorn, B.Sc.
Ernest Edward Wallen.
Ernest Walls, B.A.
Noel Stanley Walls, B.Sc.
William Nelson Watson.
Arthur Charles Vincent Weston.
Harold Bishop Williams.
Narbheshanker Amarji Yajnik, M.A.
Maxwell Williamson Young.

The following papers were read:

"Separation of minerals by decrepitation." By Dr. T. M. Lowry.
"Note on the decomposition of nitric esters by lime." By Dr. T. M. Lowry.

Ordinary Scientific Meeting, Thursday, December 18th, 1919, at 8 p.m., Sir James J. Dobbie, D.Sc., F.R.S., President, in the chair.

The President referred to the loss sustained by the Society through the death, on December 3rd, of Mr. John Emilius Lancelot Shadwell, who was elected a Fellow of the Society on June 20th, 1880.

Messrs. G. W. Anderson, F. Arnall, C. O. Barber, H. Hollings, A. Jaques, W. V. Lloyd, R. E. Machin, R. C. Menzies, C. Morton, R. A. Oddy, H. Paget, J. D. Pratt, and A. C. V. Weston were formally admitted Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

Charles Reynolds Bailey, B.A., B.Sc., Abbotsford, Great North Road, Highgate, N.6.
William Barr, 100, Mysore Road, Lavender Hill, S.W.11.
Edwin Bayley, 552, Eccles New Road, Weaste, Manchester.
Leonard Augustus Bradbury, 443, Kingsbury Road, Erdington, Birmingham.
John Austin Eastwood, Horbury, Gordon Square, Marrickville, Sydney, N.S.W.
Thomas Parker Gutteridge, B.Sc., 5, Hayle Road, Maidstone.
John Albert Jenkins, 43, Brecon Road, Hirwain, Aberdare.
Robert Jack McIntosh, M.A., Adrian House, Falkirk.
Ewan Middleton, 11, Lavington Road, West Ealing, W.13.
Joseph Harger Pye, Clevedon, Somerset.

Harry Gordon Reeves, B.Sc., 48, Devonshire Road, Handsworth Wood, Birmingham.
Cyril Montague Smith, 6, St. Peter's Gardens, Muswell Hill, N.10.
Ernest Herbert Todd, M.A., 6, Thornbury Avenue, Southampton.
Thomas Wallace, M.Sc., Tapleigh, Wingrove Road, Fenham, Newcastle-on-Tyne.

Professor James Walker, D.Sc., F.R.S., then delivered his Lecture, entitled "War Experiences in the Manufacture of Nitric Acid and the Recovery of Nitrous Fumes." A vote of thanks to Professor Walker for his lecture, proposed by Professor F. G. Donnan, seconded by Sir Robert Robertson, and supported by the President, was carried with acclamation.

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on January 15th, 1920.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

American Chemical Society. Journal. Vol. 41, No. 8, etc. Easton, Pa., Aug. 1919+. (*For circulation.*)
From the Faraday Society.

Australia, Commonwealth of. Institute of Science and Industry. Science and Industry. Vol. 1, etc. Melbourne 1919+. (*Reference.*) From the Institute.

British Science Guild. Descriptive catalogues of the British Scientific Products Exhibitions, 1918 and 1919. 2 vols. London 1918, 1919. pp. xxiii+236, xxiii+358. (*Reference.*)
From the British Science Guild.

Chemical Catalog Company. The condensed chemical dictionary: a reference volume for all requiring quick access to a large amount of essential data regarding chemicals, and other substances used in manufacturing and laboratory work. New York 1919. pp. 525. (*Reference.*) $5.
From the Chemical Catalog Co.

CHEMICAL ENGINEERING and the Works Chemist: a monthly journal of chemical technology. Vol. 9, No. 102, etc. Dover, Nov. 1919+. (*Reference.*) From the Faraday Society.

ELLIS, DAVID. Iron bacteria. London 1919. pp. xix+179. ill. 10*s.* 6*d.* net. (*Recd.* 25/10/19.)
From the Publishers: Messrs. Methuen and Co.

FRANKLIN INSTITUTE OF PENNSYLVANIA. Journal of the Franklin Institute. Devoted to science and the mechanic arts. Edited by R. B. OWENS. Vol. 186, etc. Philadelphia 1918+. (*For circulation.*) From the Faraday Society.

GARNETT, THOMAS. A treatise on the mineral waters of Harrogate: containing the history of these waters, their chemical analysis, medicinal properties, and plain directions for their use. 8th edition . . . with an appendix of cases by J. JAQUES. Knaresbrough 1829. pp. xi+176. (*Reference.*)
From C. H. Wright, Esq.

HARVEY, ARTHUR. Practical leather chemistry: a handbook of laboratory notes and methods for the use of students and works' chemists. London 1920. pp. [viii]+207. ill. 15*s.* net. (*Recd.* 10/11/19.)
From the Publishers: Messrs. Crosby Lockwood and Son.

HENRI, VICTOR. Études de photochimie. Paris 1919. pp. vii+218. ill. (*Recd.* 30/6/19.) From the Author.

INSTITUT SCIENTIFIQUE ET INDUSTRIEL. Le Mois Scientifique et Industriel. Revue universelle de la documentation technique. 21e Année, etc. Paris, June 1919+. (*Reference.*)
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JOURNAL DE CHIMIE PHYSIQUE. Edited by PHILIPPE-A. GUYE. Vol. 16, etc. Paris 1918+. (*For circulation.*)
From the Faraday Society.

MACQUER, PIERRE JOSEPH. Elemens de chymie-pratique. 3 vols. Paris 1751—1753. pp. xxiv+517, [xv]+574, xxiv+355+[xxvi]. ill. (*Reference.*) From A. Lloyd, Esq.

MEDICAL RESEARCH COMMITTEE. Report on the present state of knowledge concerning accessory food factors (vitamines). Compiled by a committee appointed jointly by the Lister Institute and the Medical Research Committee. London 1919. pp. [iv]+107. ill. (*Recd.* 9/12/19.) From the Committee.

MINISTRY OF MUNITIONS, Department of Explosives Supply. Report on the statistical work of the Factories Branch. London 1919. pp. 202. 4*s.* 6*d.* net. (*Recd.* 27/11/19.)
From the Ministry.

REVUE D'ELECTROCHIMIE ET D'ELECTROMÉTALLURGIE. Vol. 13, etc. Paris 1919+. (*Reference.*) From the Faraday Society.

Science Abstracts. Section A.—Physics. Section B.—Electrical engineering. Vol. 22. Part 11, etc. London, Nov. 1919+. (*For circulation.*) From the Faraday Society.

Società di Chimica Industriale di Milano. Giornale di Chimica Industriale. Anno I, etc. Milano 1919+. (*Reference.*) From the Faraday Society.

Society of Chemical Industry. Journal. Vol. 38, No. 13, etc. London, Aug. 1919+. (*For circulation.*) From the Faraday Society.

South Africa, Union of. Department of Mines and Industries. Industries Section. The South African Journal of Industries. Vol. 1, etc. Pretoria 1917+. (*Reference.*) From the Department.

Thorne, Percy Cyril Lesley. Chemistry from the industrial standpoint. London 1919. pp. xvi+244. ill. 4*s*. 6*d*. net. (*Recd.* 5/12/19.) From the Publishers: Messrs. Hodder and Stoughton.

II. *By Purchase.*

Arndt, Kurt. Handbuch der physikalisch-chemischen Technik für Forscher und Techniker. Stuttgart 1915. pp. xvi+830. ill. (*Recd.* 27/11/19.)

Bayliss, William Maddock. An introduction to general physiology, with practical exercises. London 1919. pp. xiv+238. ill. 7*s*. 6*d*. net. (*Recd.* 19/11/19.)

Behrens, Theodor Heinrich, and Kley, Pieter Dirk Cornelis. Mikrochemische Analyse. 3rd edition of "Anleitung zur mikrochemischen Analyse," by H. Behrens. 2 vols. Leipzig 1915. pp. xii+368, iv+136. ill. (*Recd.* 26/11/19.)

Billiter, Jean. Die elektrochemischen Verfahren der chemischen Gross-Industrie. Ihre Prinzipien und ihre Ausführung. 3 vols. Halle a. S. 1909—1918. pp. vii+284, ix+537, vi+167. ill. (*Recd.* 2/12/19.)

Blücher, H. [Editor]. Auskunftsbuch für die chemische Industrie. 10th edition. Leipzig 1918. pp. xviii+1557+14. (*Reference.*)

Cole, Sydney William. Practical physiological chemistry. 5th edition. Cambridge 1919. pp. xvi+401. ill. 15*s*. net. (*Recd.* 11/11/19.)

Dammer, Bruno, and Tietze, Oskar. Die nutzbaren Mineralien mit Ausnahme der Erze, Kalisalze, Kohlen und des Petroleums. 2 vols. Stuttgart 1913—1914. pp. xv+501, xii+539. ill. (*Recd.* 27/11/19.)

ENGLER, CARL, and HÖFER, HANS VON [Editors]. Das Erdöl, seine Physik, Chemie, Geologie, Technologie und sein Wirtschaftsbetrieb. 5 vols. and 1 case tables. Leipzig 1909—1919. pp. xvii+855, xx+967, xv+1244, xvi+777, ix+517. ill. (*Reference.*)

EULER, HANS, and LINDNER, PAUL. Chemie der Hefe und der alkoholischen Gärung. Leipzig 1915. pp. x+350. ill. (*Recd.* 9/12/19.)

GEORGIEVICS, GEORGE VON. Lehrbuch der chemischen Technologie der Gespinstfasern. II. Gespinstfasern, Wäscherei, Bleicherei, Färberei, Druckerei, Appretur. 3rd edition, edited by FRANZ ERBAN. Leipzig 1917. pp. xiii+503. ill. (*Recd.* 10/11/19.)

GREENE, J. ARTHUR (Editor), with CUNNINGHAM-CRAIG, E. H., ORMONDY, W. R., PERKIN, F. M., CAMPBELL, A., DUNSTAN, A. E., and SEABROOK, A. H. A treatise on British mineral oil. London 1919. pp. xi+233. ill. 21*s.* net. (*Recd.* 16/11/19.)

GÜNTHER, EMIL. Die Darstellung des Zinks auf elektrolytischem Wege. (Monograph. angew. Elektroch. Vol. 16.) Halle a. S. 1904. pp. xii+246. ill. (*Recd.* 29/7/19.)

HOLDE, DAVID. Untersuchung der Kohlenwasserstofföle und Fette sowie der ihnen verwandten Stoffe. 5th edition, edited by G. MEYERHEIM. Berlin 1918. pp. xxiii+774. ill. (*Recd.* 9/12/19.)

ISTITUTO DI CHIMICA FISIOLOGICA DELLA R. UNIVERSITÀ DI ROMA Archivio di Farmacologia sperimentale e Scienze affini. Vol. 27, etc. Siena 1919+. (*Reference.*)

KÜHL, HANS, and KNOTHE, WALTER. Die Chemie der hydraulischen Bindemittel: Wesen und Herstellung der hydraulischen Bindemittel. Leipzig 1915. pp. xvi+349. ill. (*Recd.* 26/11/19.)

LUCION, R. Elektrolytische Alkalichloridzerlegung mit flüssigen Metallkathoden. (Monograph. angew. Elektroch. Vol. 23.) Halle a. S. 1906. pp. viii+246. ill. (*Recd.* 29/7/19.)

MCINTOSH, JOHN GEDDES. The manufacture of varnishes and kindred industries: based on and including the "Drying oils and varnishes" of ACHILLE LIVACHE. Vol. I. The crushing, refining and boiling of linseed oil and other varnish oils. 3rd edition. London 1919. pp. viii+498. ill. 17*s.* 6*d.* net. (*Recd.* 11/11/19).

MACLEOD, JOHN JAMES RICKARD, and PEARCE, ROY G. Physiology and biochemistry in modern medicine. London 1919. pp. xxxii+903. ill. 37*s.* 6*d.* net. (*Recd.* 11/11/19.)

MATHEWS, ALBERT P. Physiological chemistry: a text-book and manual for students. 2nd edition. New York 1916. pp. xv+1040. ill. 22*s.* 6*d.* net. (*Recd.* 15/11/19.)

MEYER, HANS. Analyse und Konstitutionsermittlung organischer Verbindungen. 3rd edition. Berlin 1916. pp. xxxii + 1056. ill. (*Recd.* 9/12/19.)

PAUL, JAMES HUGH. Boiler chemistry and feed water supplies. London 1919. pp. ix + 242. ill. 14*s.* net. (*Recd.* 11/11/19.)

RIDEAL, ERIC KEIGHTLEY, and TAYLOR, HUGH STOTT. Catalysis in theory and practice. London 1919. pp. xv + 496. ill. 17*s.* net. (*Recd.* 11/11/19.)

SCHOELLER, WALTER R., and POWELL, ALAN R. The analysis of minerals and ores of the rarer elements; for analytical chemists, metallurgists, and advanced students. London 1919. pp. x + 239. 16*s.* net. (*Recd.* 11/11/19.)

TANNER, FRED WILBUR. Bacteriology and mycology of foods. London 1919. pp. vi + 592. ill. 28*s.* net. (*Recd.* 11/11/19.)

TEED, P. LITHERLAND. The chemistry and manufacture of hydrogen. London 1919. pp. vii + 152. ill. 10*s.* 6*d.* net. (*Recd.* 11/11/19.)

VOIGT, A. Die Herstellung der Sprengstoffe. Part 1. Schwarzpulver, Chloratsprengstoffe, Schiessbaumwolle, rauchschwache Schiesspulver. Halle (Saale) 1913. pp. viii + 189. ill. (*Recd.* 2/12/19.)

WILLOWS, R. S., and HATSCHEK, EMIL. Surface tension and surface energy and their influence on chemical phenomena. 2nd edition. London 1919. pp. viii + 115. ill. 4*s.* 6*d.* net. (*Recd.* 15/11/19.)

ZEITSCHRIFT FÜR FARBEN-INDUSTRIE. Edited by ARTHUR BUNTROCK. 18 Jahrgang, etc. Berlin 1919+. (*Reference.*)

III. *Pamphlets.*

AERONAUTICS, Advisory Committee for. Report on the protection of aeroplane fabric. By the Chemical Department, Royal Aircraft Factory. September 1915. London 1919. pp. 16.

—— On the testing of hydrogen for aeronautical purposes. Part 1. By GUY BARR. December 1916. London 1919. pp. 11.

ALKALI WORKS, Inspector of. Technical index to the alkali reports, with appendix. 1894 to 1917. London 1919. pp. 52.

ALLEN, E. T., and ZIES, E. G. The condition of arsenic in glass and its role in glass-making. (From the *J. Am. Ceramic Soc.*, 1918, **1**.)

—— A contribution to the methods of glass analysis, with special reference to boric acid and the two oxides of arsenic. (From the *J. Am. Ceramic Soc.*, 1918, **1**.) ill.

AUSTRALIA, COMMONWEALTH OF. *Advisory Council of Science and Industry. Bull. No.* **10**. Substitutes for tin-plate containers. Melbourne 1919. pp. 78. ill.

—— *Advisory Council of Science and Industry. Bull. No.* **11**. Paper pulp: possibilities of its manufacture in Australia. By GERALD LIGHTFOOT. Melbourne 1919. pp. 39.

BADO, ATILIO A., BERNAOLA, VICTOR J., MAZZO, AURELIO F., and DASSO, LEOPOLDO. Metodos de analisis de aguas adoptados en el Laboratorio (*Obras Sanitarias de la Nacion*). Buenos Aires 1918. pp. 98. ill.

BADO, ATILIO A., and NEGRI, MARIO L. Fabrica de alumino ferrico de las Obras Sanitarias de la Nacion. Buenos Aires 1918. pp. 15. ill.

BARKER, THOMAS VIPOND. Crystallo-chemical analysis and its use in medicine. (From *The Lancet*, 1917.) ill.

BOARD OF AGRICULTURE AND FISHERIES. Fishery investigations. Series 3. Hydrography. Review of the physical and chemical properties of the surface waters, Lighthouse observations, etc. By EDWIN C. JEE. 3 vols. in 4 parts. London 1919. pp. 76, 34, 38, 23.

BOSE, CHUNILAL. The milk supply of Calcutta: its hygienic, commercial and social aspects. (From the *Modern Review*, 1918.)

EXPLOSIVES, H.M. Chief Inspector of. List of authorised explosives. London 1917. pp. 7.

HACKH, INGO W. D. Organic symbols. (From *Science*, 1918, N.S. **48**.) ill.

—— The structure of radioactive elements. (From the *Physical Rev.*, 1919, **13**.)

JONES, MOSES WILLIAM. The history and manufacture of floor-cloth and linoleum. A paper read before the Bristol Section of the Society of Chemical Industry at the University, Nov. 21st, 1918. pp. 42. ill.

MIMURA, SHOZABURO. Charcoal burning in Japan. (From the *Bull. Forest Exp. Stat., Meguro, Tokyo*, 1915.) ill.

—— Condensation of wood vinegar in charcoal burning in Japan. (From the *Bull. Forest Exp. Stat., Meguro, Tokyo*, 1915.) ill.

MINISTRY OF MUNITIONS, *Munitions Inventions Department*. Report on the investigations carried out by the Chemical Waste Products Committee. London 1919. pp. 24.

—— *Munitions Inventions Department*. Nitrogen Products Committee. The oxidation of ammonia applied to vitriol chamber plants. Revised edition. London 1919. pp. 12. ill.

MOIR, JAMES. Errors in the analysis of chrome ironstone, and

a new process. (From the *J. S. African Assoc. Anal. Chemists*, 1919, **1**.)

Morey, George W. Solubility and fusion relations at high temperatures and pressures. (From the *J. Engineers' Club of Philadelphia*, 1918.) ill.

Moriya, Monoshiro, and Shirasawa, Homi. Tapping of lac. (From the *Bull. Forest Exp. Stat., Meguro, Tokyo*, 1915.)

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